```
To:
                               NAVFAC MIDLANT, ROICC Camp Lejeune;
                                                                               NAVFAC MIDLANT, CI; (b)
                             NAVFAC MIDLANT, ROICC Camp Lejeune (b)
                                                                              NAVFAC MIDLANT, RIOCC Camp
                                         NAVFAC MIDLANT, ROICC Camp Lejeune;
                  MIDLANT, ROICC (
                                                            NAVFAC MIDLANT, RÓICC Camp Lejeune
                                                          (Group III Mgt.) (b)(6)
Cc:
                                                                                (PM, Group III Management);
                                (Group III Mgt Superintendent); (b) (6)
Subject:
                  [Non-DoD Source] RE: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS
Date:
                  Monday, July 11, 2016 10:10:38
Thanks for your help to make this schedule.
        is working with our sub on our punchlist. (b)(6) told my sub this Saturday that after completion of
our punchlist he would be ready to go over 2 days to develop his punchlist at the CLEO. I think we're moving in
the right direction.
I have the cost proposal for the Visitor's Center drainage on my desk. Will send it to you today. Thanks. R/
             | Deputy Project Manager & Small Business Liaison | |
311 Parachute Tower Road | Camp Lejeune, NC 28542 |
                                        | Email: (b)(6
Dragados USA, Inc. is An Equal Opportunity Employer
----Original Message----
                      NAVFAC MIDLANT, ROICC Camp Lejeune [mailto:(b)(6)
From: (b)(6)
Sent: Monday, July 11, 2016 10:00 AM
                                     NAVFAC MIDLANT, CI;
                                                                                   NAVFAC MIDLANT.
ROICC Camp Lejeune:
                                          NAVFAC MIDLANT, RIOCC Camp
NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6)
                                                                      NAVFAC MIDLANT, ROICC Camp
                          NAVFAC MIDLANT, ROICC Camp Lejeune
                                                   (Group III Mgt.);
                                                                                (PM, Group III
                              (Group III Mgt Superintendent); (b)
Management); (b)(6)
Subject: RE: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS
/A11
will be onsite to do TAB and controls verification July 25th and 26th, and the morning of the 27th if
necessary. Please have the appropriate subs on site.
          PE
Supervisory Construction Manager
ROICC, Camp Lejeune, NC
----Original Message-----
From (b)(6)
                    [\underline{\text{mailto}}(b)(6)]
Sent: Thursday, July 07, 2016 2:32 PM
                    NAVFAC MIDLANT, ROICC Camp Lejeune: (b) (6
                                                                                   NAVFAC MIDLANT,
                         NAVFAC MIDLANT, ROICC Camp Lejeune;
                                                                                         NAVFAC
CI;
MIDLANT, RIOCC Camp Lejeune
                                                                                (PM, Group III
Cc: (b) (6)
                                                   (Group III Mgt.): (b) (6)
                              (Group III Mgt Superintendent):(b)
Management); (b) (6)
Subject: [Non-DoD Source] TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS
```

From:

Good afternoon (b) / (b) (6). Attached are the revised TAB test reports for the CLEO building. It was reviewed and signed by my QC Manager. All changes identified by have been made. Peter's last comments are included at the end of the attachment. Reques (b) (6) review and comment as soon as he is able. I am sending this digitally-only for now. Please advise if you feel hard copy should follow. I recommend sending hard copy for the files once this gets approved. Thanks. R/ (b)

(b)(6) | Deputy Project Manager & Small Business Liaison | |

311 Parachute Tower Road | Camp Lejeune, NC 28542 |

Phone: w (b)(6) c (b)(6) Email: (b)(6)

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From: NAVFAC MIDLANT, ROICC Camp Lejeune

NAVFAC MIDLANT, Staff (b)(6) To: NAVFAC MIDLANT, BD NAVFAC MIDLANT, ROICC Camp Lejeune NAVFAC MIDLANT, ROICC Camp Lejeune (6)

Correspondence Regarding Group III (Email 4), Freedom of Information Act (FOIA) Request DON-NAVY-2017-Subject:

003161 - Camp Lejeune - P1383 & P1384 Base Entry Point / CLEO Building Projects Contract No. K1310-002-S /

Project Number K1310 SLO Case No. 16-970

Date: Friday, May 12, 2017 13:23:51

Attachments:

Non-DoD Source RE P-1383 CLEO TAB Verification and PVT field checks preparations.msg Non-DoD Source RE TRANSMITTAL 1238 REV 1 CLEO TAB TEST REPORTS.msg

P-1383 CLEO TAB Verification and PVT field checks preparations.msg

Non-DoD Source RE TRANSMITTAL 1238 REV 1 CLEO TAB TEST REPORTS.msg

RE TRANSMITTAL 1238 REV 1 CLEO TAB TEST REPORTS.msg

Non-DoD Source TRANSMITTAL 1238 REV 1 CLEO TAB TEST REPORTS.msg

FYI

(b)(6)Contract Specialist

ROICC Camp Lejeune

DSN (b)

fax

From: (b)(6)

To: NAVFAC MIDLANT, CI; (b) (6)

Cc: (b)(6) (Group III Mgt.);(b)(6) (PM, Group III Management); (b)(6) (Group III Mgt Superintendent) (b)(6)

(b) (6) (b) (6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b) (6) NAVFAC MIDLANT, ROICC Camp Lejeune (b) (6) NAVFAC MIDLANT, ROICC Camp Lejeune (b) (6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b) (6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b) (6) NAVFAC MIDLANT, ROICC

Camp Leieune

Subject: [Non-DoD Source] RE: P-1383 CLEO TAB Verification and PVT field checks preparations

Date: Friday, July 22, 2016 16:39:04
Attachments: Pre PVT Trends and Pre FPT (3).pdf

(b)

Attached is a file with Pre-PVT Checklist, Trends, and Pre-FPT.

The FPT with the signs on will be submitted on Monday in the morning as well as the most recent Pre-FPT and/or any other as requested.

Sorry we couldn't arrange in this last 2 days to get a copy of the documents. Anyway, all the HVAC equipment are working and the system ready for PVT.

Thank You

(b)(6) / Quality Control Manager | 311 Parachute Tower Road, Camp Lejeune, NC 28542
Cell Phone (b)(6) | Phone: (b)(6) | Fax: | Email: (b)(6)

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----Original Message----

From: (b)(6) NAVFAC MIDLANT, CI [mailto(b)(6)

Sent: Wednesday, July 20, 2016 4:34 PM

To (b)(6)

Cc: (b)(6) (Group III Mgt.);(b)(6) (PM, Group III

Management): (b)(6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6) (Group III Mgt Superintendent); (b)(6) NAVFAC MIDLANT, ROICC Camp Lejeune;

(b)(6) NAVFAC MIDLANT, RIOCC Camp Lejeune; (b)(6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6) NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6)

(b) NAVFAC MIDLANT, ROICC Camp Lejeune

Subject: P-1383 CLEO TAB Verification and PVT field checks preparations

(b)(6)

In preparation for the TAB verification and PVT next week, please provide a copy of the completed Pre-FPT and FPT checklists as completed by the commissioning agent, and the completed Pre-PVT checklist and control system trend log graphs by the controls subcontractor by Friday, 22 July. The creation of the graphic trend logs may be the only item that has not been completed at this point.

To clarify my request:

- 1) Pre-FPT checklists, filled out with signatures, are necessary to perform the FPT/TAB.
- 2) FPT checklists, filled out with signatures, are necessary to confirm system readiness for PVT.
- 3) Pre-PVT checklist, filled out, is necessary to confirm DDC system readiness for PVT.
- 4) Control Loop Trend Logs (as graphs) are necessary to conform system stability prior to PVT:
 - a) graphical plots required under 23 09 23.13 22 section 3.5.10 can be combined with those of section 3.5.4.q.
 - b) graphical plots should contain trends of each variable point (zone temperatures, damper positions, etc.)
 - c) variable point trends should be overlaid on setpoint trends (e.g.: zone temp and cooling setpoint on same graph)
 - d) for ease of printing, when necessary, graphs should be on a white or light color background
 - e) graphical plots should illustrate system responses to changes in set points and/or parameters
 - f) based on (a) and (e), the length of trended data can vary, but appropriately scaled 24/48 hour spans are

acceptable

g) DDC system screenshots are acceptable provided they show both the variable point and the set point together

All four items can be submitted electronically via email.

Please contact me before Friday should there be any questions on the above.

Respectfully,

```
, EIT, PMP
Mechanical Acceptance Engineer
                                                 / FAX: (b)(6)
            / DSN (b)(6)
                            / CELL (b)(6)
----Original Message----
                     NAVFAC MIDLANT, ROICC Camp Lejeune
From
Sent: Monday, July 11, 2016 10:00 AM
To (D)
                                   NAVFAC MIDLANT, CI;
                                                                                NAVFAC MIDLANT,
                                        NAVFAC MIDLANT, RIOCC Camp Lejeune; (b)(6)
ROICC Camp Lejeune: (b) (6)
NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6)
                                                                   NAVFAC MIDLANT, ROICC Camp
                         NAVFAC MIDLANT, ROICC Camp Lejeune
                                                  Group III Mgt.); (b)(6)
                                                                            (PM, Group III
                             (Group III Mgt Superintendent); (b)(6
Management):
Subject: RE: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS
    /All
will be onsite to do TAB and controls verification July 25th and 26th, and the morning of the 27th if
necessary. Please have the appropriate subs on site.
        , PE
Supervisory Construction Manager
ROICC, Camp Lejeune, NC
----Original Message----
From (b) (6)
                   [mailto:(b)(6
Sent: Thursday, July 07, 2016 2:32 PM
                   NAVFAC MIDLANT, ROICC Camp Lejeune:
                                                                               NAVFAC MIDLANT,
To
CI;
                        NAVFAC MIDLANT, ROICC Camp Lejeune;
                                                                                     NAVFAC
MIDLANT, RIOCC Camp Lejeune
                                                 (Group III Mgt.);(b)(6)
                                                                            (PM, Group III
                            (Group III Mgt Superintendent); (b)
Subject: [Non-DoD Source] TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS
Good afternoon (b) / (b) (6)
                              . Attached are the revised TAB test reports for the CLEO building. It was
reviewed and signed by my QC Manager. All changes identified by have been made. (b)(6) last comments
are included at the end of the attachment. Request (b)(6) review and comment as soon as he is able. I am sending
this digitally-only for now. Please advise if you feel hard copy should follow. I recommend sending hard copy for
the files once this gets approved. Thanks. R/
```

(b)(6) | Deputy Project Manager & Small Business Liaison | |

311 Parachute Tower Road | Camp Lejeune, NC 28542 |

Phone: w (b)(6) | c (b)(6) | Email: (b)(6)

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2820 West Vernon Ave., Kinston, NC (28504)

Phone (252) 527-3333

(252) 527-3377

July 22, 2016

To: (b)(6) From:

Re: Pre-PVT Checklist, Trends, & Pre-FPT Checklist

- Pre-PVT- Item #U Please see the note that a laptop will be turned over to the Owner at the end
 of the project.
- Trends- The Trends for Geothermal Water Temperatures HP-1, HP-3, and HP-4 are included. Group III had HP-2 turned off insulating the condensate lines.
- Pre-FPT- Please note that as of the Pre-FPT's that the HPWH pump was not operating as designed. The pump is now operating and there is Hot Water to the Building.

Cc: (b)(6)

P1383 New Base Entry Point Section 23 09 23.13 20

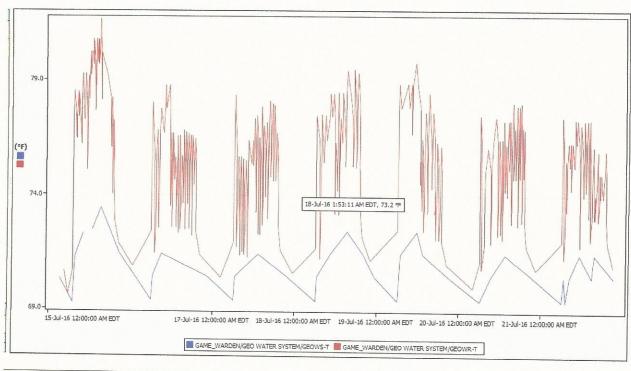
.n.	Verify all valve and actuator zero and span adjustments are set properly. Yes No
.0.	Verify all sensor readings are accurate and calibrated. Yes No
.p.	Verify each control valve and actuator goes to normal position upon loss of power. Yes No
.q.	Verify all control loops are tuned for smooth and stable operation. View trend data where applicable. Yes No
.r.	Verify each controller works properly in stand-alone mode.
,s,	Verify all safety controls and devices function properly, including freeze protection and interfaces with building fire alarm systems. Yes No
.t.	Verify all electrical interlocks work properly. Yes No
.۱	Verify all workstations, notebooks, and maintenance personnel interface tools are delivered, all system and database software is installed, and graphic pages are created for each workstation and notebook. Yes No END of CONTRACT
	v. Verify the as-built (shop) control drawings are complete. Yes No

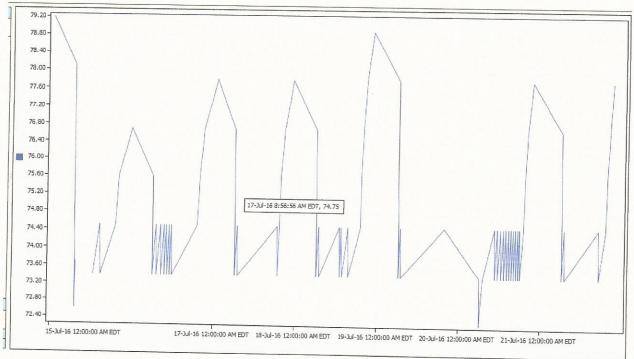
Atr Num 5-6-16

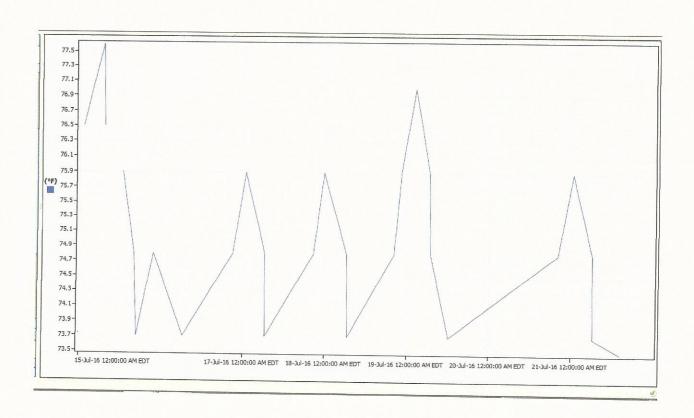
P1383 New Base Entry Point Section 23 09 23.13 20

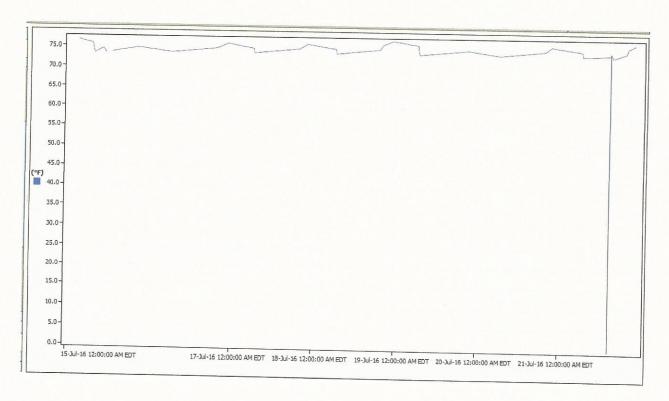
Pre-Performance Verification Testing Checklist

eq	erify all required mechanical installation work is successfully completed, and all HVAC pulpment is working correctly (or will be by the time PVT is conducted). Yes No
b. Ve	erify HVAC motors operate below full-load amperage ratings. YesNo
.c. V	erify all required control system components, wiring, and accessories are installed. Yes No
.d. V -	erify the installed control system architecture matches approved drawings. Yes No
.e. V	erify all control circuits operate at the proper voltage and are free from grounds or faults. YesNo
	/erify all required surge protection is installedtYesNo
	Verify the A/C Power Table specified in "CONTROLS SYSTEMS OPERATORS MANUALS" is No No
	Verify all DDC network communications function properly, including uploading and downloading programming changes. Yes No
1	Using the BACnet protocol analyzer (if provided or required in this specification), verify communications are error free. YesNo
j.	Verify each digital controller's programming is backed up. YesNo
.k.	Verify all wiring, components, and panels are properly labeled. Yes No
1.	Verify all required points are programmed into devices. YesNo
.m.	Verify all TAB work affecting controls is complete. YesNo











Commissioning Solutions, Inc.

3850-A Airport Road, NW Wilson, NC 27896 (252)-291-5100

COMMISSIONING REPORT
CONSERVATION LAW ENFORCEMENT OFFICE (CLEO)

BASE ENTRY POINT OLD SAWMILL ROAD P-1383

MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

FEBRUARY 2016





COMMISSIONING CHECK SHEET Centrifugal Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	SMARCH 2016
EQUIPMENT TAG	P-1	LOCATION	Mechanical Room
SYSTEM	Geothermal Loop	DWG. NO	WM101/WM601
		- Introduces	

				As Scheduled		
Make	B&G	M	odel Number	Series 90	Serial Number	r NG
HP	2.0	Impeller Diam	eter – inches	1.25"	Volts/FL Am	The state of the s
GPM	46		Ft Head	54	Pump RPM	3450
Service	Geother	rmal Loop	Speed	Control No	Efficiency	NG

		As Submitted			
Make	Model Nur	nber		Serial Number	er
HP	Impeller Diameter - in	ches		Volts/FL Am	
GPM	The state of the s	Head		Pump RPM	p3
Service		Speed Control	Efficie	Contraction of the Contraction o	

Make	BIG							
	019	Mo	del Number	SERIES	90	Serial Number	er	
	1.5	IMPELLER		4.375"		Volts/Amps		208U/10, 9.1A
GPM	SEE TA	B REPORT	Ft Head	54.3 F	T	Pump RPM	34	
Service (GROLIFI	RMAL LOOP	Speed	Control	*	Efficiency	PREM	

Pre Functional Checklist Item and Description	NA	Yes	No.	Comments
Pump Installation				
Piping system installed		/		
Piping system bot water filled and flushed CONDENSER WATER		V		
Piping system bot water pump make up water set		1		
Pump start up strainer removed or strainer cleaned		/		
Adjustable foot support installed underneath suction diffuser	V			
Pressure/temperature gauges/ports installed		V		





COMMISSIONING CHECK SHEET Centrifugal Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	SMARCH 2016	
EQUIPMENT TAG	P-1	LOCATION	Mechanical Room	_
SYSTEM	Geothermal Loop	DWG. NO	WM101/WM601	

Pre Functional Checklist Item and Description	NA	Yes	No	Comments
Valves installed per detail drawing		~		
Pressure relief valve and size installed per drawings		V		
Pump Electrical				
Power available to pump disconnect.		1		
Proper motor rotation verified		V		
Power available to Variable Frequency Drive	V			NOTFUNCTIONAL
Starter overload heaters set to FLA of motor/sized correctly		1		NOTFUNCTIONAL VFD BYPASSED
Control system interlocks functional		1		
Verify that disconnect is located within sight of the unit it controls		V		
Pump Controls				
Verify proper location, installation and calibration of the water temperature sensors				
Pump volume controller-VFD operable			V	

om	-	 4

PUMP RUNNING IN BYPASS, CIRCUITSETTER USED TO CALIBRATE DESIGN FLOW.

Piping leak test complete.

Piping insulated as required.

Verify open/closed status of control valves

Flexible connectors installed as specified.

Valve direction verified





COMMISSIONING CHECK SHEET Water Source Heat Pump

		PR	EF	UNCTIONAL	PERFORM	ANCE	TES	T (1	PFP'	T)							
PROJEC'	r	Camp I	eieu	ne - Base Entry Pe	oint		TE	ESTI	TAC	TG .	213	UNI	£ 7.	No			
EQUIPM	ENT TAG	Admin	Bldg	HPWH-1	OIII.			CA'			-				n		
SYSTEM		Geother	mal	Water Heating			LOCATION Mechanic DWG. NO WM-401/						-	-	THE REAL PROPERTY.		
										\ -					-		59)
								Mention beauty									
Make	Florida II.	-4 D			As Scheduled												
IVIAKE	Florida He			Model Number g Capacity	WT025		Seri	AND DESCRIPTION	ON OWNERS OF	-		_	VG				
Temp In	115-deg	V/Amps	STATE OF THE PERSON NAMED IN	208/I	N/A	106	Tota	II He	atıng	Cap	acity	/ 2	20,00	00 B	ruh		
	Water GPM		4.0	200/1	Temp Out	125	- D -		CSTIN	T	7				-		
THE RESERVE AND ADDRESS OF THE PARTY OF THE	Set Point 7			125-deg F		Hot Ga	s Ke	neat	(Y/I	٧)	1	N/A					
	. Soil Ollit 1	Cimporatu		123-deg 1												- 1	
			-					daylo y feet you	_				-	-	-		
					As Submitted					-		-					-
Make		I	Mode	el Number	T Dubiniteed		Seria	al Ni	mbe	T		-					-
		Total Co	oling	g Capacity			Tota	Call Market Barrier		PARTICIPATION OF THE PARTICIPA	acity	7		-			-
Temp In		Volts/Ar	nps							,			-		-		1
the property of the last of th	Water GPM					Č	as R	ehear	(Y	(N)	- Inches	T					1
Comments:						100					,W.						1
				NAV													
		1,000		of Functional			teles/trusce					-			-		١
			N	', '			on	tract	or)								-
Make							The state of the s	erial	The Real Property lies	ber	-		T				me
Town In		Tot					T	otal]	Heat	ing (apa	city					-
Temp In Condenser	Water CDM	Voh															1000
Comments:	water GPIVI							heat	(Ye	s or l	No)						Digital
Comments.																	
								Accession				-					
																	-
							_										
										Com-Agent	cal	a		SO.	er	##	
	Pre Functi	ional Ch	ec.	-	aription		NA	Yes	No	-Ag	ıanı	tric	TAB	rol	E	nen	
							1			om	Mechanical	Electrical	T	Controls	Cr-Officer	Comment #	
D:										Ö	2	H		0	0	Ö	
Piping Ins	The same of the sa																
Piping Con	nections co	mplete.									X						

XX

X

X

X

X

X

X





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	
EQUIPMENT TAG	Admin Bldg HPWH-1	LOCATION	Mechanical Room
SYSTEM	Geothermal Water Heating	DWG. NO	WM-401/WP-501

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Unit Installation										
Inspection and access doors are operable and sealed					X					
Condenser water piping properly connected					X		X			
Condensate drainage is unobstructed and routed to drain					X					
					X		X			
Unit Electrical										
Power available to unit disconnect(s).	T					X				
Power available to unit control panel						X				
					X	X	X			
Verify that disconnect(s) is located within sight of the unit it controls	\top					X				
Power available to electric heating coil						X				
Unit Controls										
Temperature Sensors installed/wiring complete					X		X	X		ORNIS PER I
Control valves operable					X		X			-
Unit control system operable and verified					X		X	X		
Verify proper location and installation of temperature sensor					X					\neg
Testing, Adjusting, and Balancing										
TAB Report submitted				Description of	X		X			

Comment	
Comments:	

COMMISSIONING CHECK SHEET Energy Recovery Ventilator System PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT Camp Lejeune – Base Entry Point EQUIPMENT TAG SYSTEM ERV-1 Administration Building				TEST DATE LOCATION DWG. NO	Mechanic WM-401/	al Room				
					As Schedul	ed				
Make	Gree	enheck]	Model Nu	mber	Minive	nt - 750	Serial N	umber	NG	
		Cooling C			N/A		Heating		N/A	
SF HP	0.5	SF Volts/F	L Amps	120/1	SF CF	M 720	THE RESIDENCE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE OW	TSP-in. wg	0.50	
EF HP	0.5	EF Volts/F	L Amps	120/1	EF CFI	M 500		TSP-in. wg	0.5	
		117			l speed direct					
					As Submitte	ed				
Make			Model Number			Serial Number		Serial Number		
		Cooling Ca					Heating Ca	pacity		
SF HP		SF Volts/FL Amps			SF CFM		SF ESP/TSP-in. v			
EF HP		EF Volts/FI	Amps		EF CFM		EF ESP /TS	SP-in. wg		
Comme	nts:									
					As Installed	ı				
Make	The same of the same of	enheck	Model	Number	MV-150-	PSC	Serial Num	ber	1396758	
		Cooling Cap					Heating Car		NIA	
The same of the sa		SF Volts/FL			SF CFM	TBD	SF ESP/TSI		- 19	
F HP	.25	EF Volts/FL	Amps		EF CFM	TBP	EF ESP/TS			
Commen	its 5	ise tab re	foli for	AIR FLOW	DATA - S	UPPLY FA	P ZzilAust F	AJ		
		Request	ed docum	entation su	bmitted		Rec'd	Com		
Submit	tals w	ith performa					₩.	Comi	ments	
		art-up Sheet								
-1PI	- wash NI	me ab oncer	0				Ø			

COMMISSIONING CHECK SHEET Energy Recovery Ventilator System PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT EQUIPMENT TAG	Camp Lejeune - Base Entry Point	TEST DATE	8 MARCH 2016
	ERV-1	LOCATION	Mechanical Room
SYSTEM	Administration Building	DWG. NO	WM-401/WM-601

Pre Functional Checklist Item and Description	NA	Yes	No	Comment #
Ductwork Installation-Pre Commissioning Checks				
Ductwork complete.		/		
Ductwork leak test complete.		V		
Fire dampers, smoke dampers, and access doors installed as required.	V			Not Requires
Ductwork insulated as required.		V		1770407000
Thermometers and gauges installed as required.		V		
Verify open/closed status of dampers.		1		
Verify smoke dampers operation.	1			NOT REQUIRED
Flexible connectors installed as specified.				POT NEGOTALO
ERV Installation				
Installation and access doors are operable and sealed		~		
Condensate drainage is unobstructed. (Visually verify drainage by				
pouring a cup of water into drain pan).		V		
Fan belt adjusted. Supply Fan	1			DIARCE OKIVE
Fan belt adjusted. Exhaust Fan				DIRECTORISE
Construction filters removed and correct filters installed			V	
Start-up and checkout complete				
ERV Electrical				
Power available to unit disconnect(s).	RESERVED AND ADDRESS OF THE PARTY OF THE PAR		No. of London	
Power available to unit control panel		V		
Proper motor rotation verified on the Supply Fan				
Proper motor rotation verified on the Exhaust Fan				
Verify that disconnect(s) is located within sight of the unit it controls				
ERV Controls		V	NO CONTRACTOR OF	
Outside Air Damper/actuator properly installed		1		
Return Air Damper/actuator properly installed		./		
Relief/Exhaust Air Damper/actuator properly installed		V		
Outside Air Damper/actuator operable		V		
Return Air Damper/actuator operable		V		
Relief/Exhaust Air Damper/actuator operable		7		- 4
Supply Fan air volume controller-VFD operable				DIRECT ORIVE
Exhaust Fan air volume controller-VFD operable				
Air handling unit control system operational.	-	_		
o o o o o o o o o o o o o o o o o o o				

COMMISSIONING CHECK SHEET Energy Recovery Ventilator System PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT EQUIPMENT TAG SYSTEM	Camp Lejeune – Base Entry Point ERV-1 Administration Building	TEST DATE LOCATION DWG. NO	Mechanical Room WM-401/WM-601
Comments:			

Pre-functional checklist items are to be completed as part of stat-up & initial checkout, preparatory to performing functional performance test procedures, prior to performance of TAB.

 This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.





COMMISSIONING CHECK SHEET Exhaust Fan PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT EQUIPMENT TAG SYSTEM	Camp Lejeune - Base Entry Point	TEST DATE	SMARCH 2016	
		LOCATION	Women's	
	Toilet Room Ventilation	_ DWG. NO	WM101/WM601	

Make	Panasonic	Model Number	FV-08VKS2	Serial Number	NG
Fan HP	16.2W		Ceiling	Volts/Amps	120/1
CFM	50		Direct Drive	, total impo	120/1

	As Submi	tted	
Make	Model Number	Serial Number	
Fan HP		Volts/Amps	
CFM		VOIIS/AIIIDS	

			As Installed		
Make	PANASONIC	Model Number	FV-05-11VKS1	Serial Number	NIA
Fan HP	12W		CEILING	Volts/Amps	120/1 .1A
CFM	SEV TAB REPO	RT	DIRECT DRIVE	T CALLET AMIPS	1.001.

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls		Comment #
Exhaust Fan Installation										
Unit installed with wall/ceiling brackets and at the proper height per Manufacturer's recommendations		V				X	X	X		
Exhaust Fan Electrical							See See			
Power available to unit disconnect.		./					v			
Proper motor rotation verified	+	/	-			_	X	37	-	-
Verify that the power disconnect is located within sight of the unit it controls		V					X	X		
Exhaust Fan Controls		-							Routeto a	
Verify proper location and installation of the thermostat (No)	1/					X				
Verify Intake louver opens with fan start	V			-	-	A X	-	-	\dashv	Carrier





COMMISSIONING CHECK SHEET Exhaust Fan PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	8 LIAACH ZONG	
EQUIPMENT TAG	Admin Bldg EF-1	LOCATION	Women's	
SYSTEM	Toilet Room Ventilation	DWG. NO	WM101/WM601	

Comments:

COMMON EXHAUST BACK TO ERUUPIT - FAN OPERATIONAL





COMMISSIONING CHECK SHEET Exhaust Fan PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT EQUIPN SYSTEM	MENT TAG	Admin	Bldg El	Base Entry -2 entilation	y Point	LC		DAT TION NO	1	Me	n's	/WI			
					As Scheduled										
Make	Panasonic		Mod	lel Number	FV-08VKS2	Sei	ial	Num	ber		NO	ì			
Fan HP	16.2W				Ceiling	Vo	lts//	Amp	s		12	0/1	Plantagemen	-	
CFM	ts: Speed Co				Direct Drive				T	-	- AMERICAN		malares is	(Application)	
					As Submitted										
Make	1		Mode	l Number	As Submitted	T 0:	137	1		_					
Fan HP	 		I Mode	i ivuilioei		Seri	-	-	er	+					
CFM						Volt	S/A	mps	_		-				
Comment	is:														
					As Installed										Epithia (tip majura)
Make	PANASON	16	Mode	l Number	FU-OS-11VKS1	Seria	al N	umb	er	T	N	A			
Fan HP	12M				CRILING	Volt	s/Aı	nps			120	Ji.	.14	-	Assessment for some
CFM	SER LAE	REPOR	5		DIRECT DRIVE							- April 10		distribution	
Comment	s: Steep c	enthol	INST	Auto - a	CWPANOY SENSOR										
	Pre Functi	onal Ch	ecklist	Item and	Description	IA	es	No	Agent	anical	trical	4B	rols		nent #

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls		Comment #
Exhaust Fan Installation										
Unit installed with wall/ceiling brackets and at the proper height per Manufacturer's recommendations		~				X	X	X		
Exhaust Fan Electrical										
Power available to unit disconnect.		V				2000	X			
Proper motor rotation verified		V				_	X	X		
Verify that the power disconnect is located within sight of the unit it controls		/					X	Λ		
Exhaust Fan Controls							E			
Verify proper location and installation of the thermostat (po)	V					X				
Verify Intake louver opens with fan start	~					X			\dashv	-





COMMISSIONING CHECK SHEET **Exhaust Fan** PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT EQUIPMENT TAG SYSTEM	Camp Lejeune – Base Entry Point Admin Bldg EF-2 Toilet Room Ventilation	TEST DATE LOCATION DWG. NO	8 MARCI 2016 Men's WM101/WM601
Comments:	EXHAUST BACKTO EKUUNIT - FAL	of erasional	





COMMISSIONING CHECK SHEET Exhaust Fan PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	SMARCH ZOID	
EQUIPMENT TAG	Admin Bldg EF-3	LOCATION	Vehicle Storage	
SYSTEM	Room Ventilation	DWG. NO	WM101/WM601	

As Scheduled						
Make	Greenheck	Model Number	SE1-12-432	Serial Number	NG	
Fan HP	1/20		Sidewall	Volts/Amps	120/1	
CFM	300		Direct Drive		120/1	
Comments	s: Speed Control	Required	Direct Direc			

As Submitted					
Make	Model Number	Serial Number			
Fan HP		Volts/Amps			
CFM		VOIIS/Allips			

161			As Installed		
Make	GREENHECK	Model Number	SE1-12-432	Serial Number	NIA
Fan HP 118			SIDYWALL	Volts/Amps	120/1, 1.6A
CFM Commen	SEE TAB REPO	RT	DIRECT DAIVE		1.64

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls		Comment #
Exhaust Fan Installation										
Unit installed with wall/ceiling brackets and at the proper height per Manufacturer's recommendations		/				X	X	X		
Exhaust Fan Electrical									SERVICE S	
Power available to unit disconnect.										210
Proper motor rotation verified	+	V	_	-	_		X			-
Verify that the power disconnect is located within sight of the unit it controls		-					X	X		
Exhaust Fan Controls	Participation of	V	ionesis i	re-cold a	Antistana a	ili Gallaga e				
Verify proper location and installation of the thermostat (N2)	V					X				
Verify Intake louver opens with fan start		V				X	T			





COMMISSIONING CHECK SHEET Exhaust Fan PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	BMARCH 2016	
EQUIPMENT TAG	Admin Bldg EF-3	LOCATION	Vehicle Storage	
SYSTEM	Room Ventilation	DWG. NO	WM101/WM601	

Comments:

- FAN RONS BASED ON GO TESTSWITCH .
- BYCOMMENO FAN ON OFF SWITCH INSTALLED TO PROJUDE VENTILATION





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT
EQUIPMENT TAG
SYSTEM

Camp Lejeune - Base Entry Point	
Admin/Classroom WSHP-1	
Heating and Cooling	

TEST DATE | 11 July 20 (le | LOCATION | Room # 131 | WM-102/WM-401

Make	Flori	da Heat Pump	Model Number	As Sche		Serial Number		NG	
	Total Cooling Capacit		Capacity	37,000 BT		Total Heating Capacity		33,700 BTUH	
SF HP		Volts/Amps	208/1	SF CFM	1450	SF ESP (in. wg)	10)	0.5	
CONTRACTOR OF THE PARTY OF THE		er GPM tside Air = 150	12		Hot Ga	s Reheat (Yes or No)	No		

Make		Model Number	As Submi	All and a second a	Serial Number	
		ling Capacity		The second second	Total Heating Capacity	-
SF HP	Volts/Am	os	SF CFM		SF ESP (in. wg)	
Condenser V	Vater GPM				as Reheat (Yes or No)	

Make	CLIMATE MASTER		Model Number	TTVDA9		talling contractor) Serial Number	5148 28806
an in	<u> </u>		ng Capacity	31.0 MB	H	Total Heating Capacity	311-28000
SF HP		SF Volts/A		SF CFM	1450	SF ESP (in. wg)	0.40
Condens		GPM	SEE TAB REPORT		Hot Gas	Reheat (Yes or No)	0.70

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Ductwork Installation				a see a			海海			
Ductwork complete.		./			37					
Ductwork leak test complete.	+	1/	-		X					
Fire dampers, smoke dampers, and access doors installed as required.	1/	-	-		X					
Ductwork insulated as required.	-	-			X		X			
Verify open/closed status of dampers.	+-	V			X					
Verify smoke dampers operation.	-	4		_	X		X	X		
Flexible connectors installed as specified.	V				X		X			
restroic conficcions histarica as specified.		V		T	X				7	





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	11 Jour 2016
EQUIPMENT TAG	Admin/Classroom WSHP-1	LOCATION	Room # 131
SYSTEM	Heating and Cooling	DWG. NO	WM-102/WM-401

					-					
Pre Functional Checklist Item and Description	AN	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
AHU Installation										
Inspection and access doors are operable and sealed		V			X					
Condensate water piping properly connected		V			X		X			
Condensate drainage is unobstructed and routed to drain	\top	V			X			\vdash		
Fan belt adjusted. Supply Fan (if applicable) (DIAEG DAIVE)	V	1			X		X	H		
Construction filters removed and correct filters installed			/		X		X			-
Compressor properly connected		V			71	X	73	H	\dashv	
AHU Electrical						1				
Power available to unit disconnect(s).		1				X				
Power available to unit control panel		1	\vdash		-	X	\dashv		-	-
Proper motor rotation verified on the Supply Fan	1	V	\vdash		X	X	X		-	\dashv
Verify that disconnect(s) is located within sight of the unit it controls	+	1	\vdash	\dashv	A	$\hat{\mathbf{X}}$	^	-	+	\dashv
Power available to electric heating coil	V			\dashv	\dashv	X	-	-	-	\dashv
AHU Coils/Compressor										
Condenser water piping properly connected	1	/			X					
AHU Controls										
Discharge Air Temperature Sensor installed/wiring complete		V			X		X	77		
Zone Temperature Sensor installed/wiring complete	+	1	\dashv	-	Ĥ	-	_	X	+	_
Auxiliary Float Switch installed/wiring complete	1	-	-	_	$\frac{\Delta}{X}$	+	4	4	+	\dashv
Control valves operable	+	1	\dashv		$\frac{\Lambda}{X}$	+	-	\rightarrow	_	
Unit control system operable and verified	+	/	-	-	-	_	X	-	4	_
Verify proper location and installation of the thermostat	+	7	\dashv	_	X	+	X	X	+	_
Testing, Adjusting, and Balancing					X					
TAB Report submitted (SELOND SUGMIFFAL)		V								
		V	1	- 1	X	- 1	X			1

0-	
Comments:	





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	
EQUIPMENT TAC	j
SYSTEM	

Camp Lejeune - Base Entry Point	
Admin/Classroom WSHP-2	
Heating and Cooling	

Make	Flori	da Heat Pump	Model Number	AP035		Serial Number	NG
		Total Coolin	g Capacity	40,100 BT	10,100 BTUH Total Heating Ca		37,800 BTUH
SF HP	50		208/1	SF CFM	1020	SF ESP (in. wg)	0.5
Condens	er Wat	er GPM	9		Hot Ga	s Reheat (Yes or No) No	0

		Model Number			Serial Number	
		ing Capacity			Total Heating Capacity	
SF HP Volts/Amps)S	SF CFM		SF ESP (in. wg)	
Condenser V Comments:	Vater GPM			Hot C	Gas Reheat (Yes or No)	

Make	CLIMATE MASTER			T11/038		Serial Number	514625322
		Total Cooli	ng Capacity	40		Total Heating Capacity	
SF HP	0.5	SF Volts/A	mps 208/1	SF CFM	IDILe	SF ESP (in. wg)	0.69
Condens Commen		r GPM	see tab rep	alt		Reheat (Yes or No)	

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Ductwork Installation										
Ductwork complete.	-	1	ere population		X					
Ductwork leak test complete.	+	1			X	\vdash		_		
Fire dampers, smoke dampers, and access doors installed as required.					X	\vdash	v			
Ductwork insulated as required.	V				-		X	_		
Verify open/closed status of dampers.	+		-		X		77	-	_	
Verify smoke dampers operation.	1./	2			X	_	X	X	_	
Flexible connectors installed as specified.	V	V		-	X		X	-	-	





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	11 July 2016
EQUIPMENT TAG	Admin/Classroom WSHP-2	LOCATION DWG, NO	Room # 109
SYSTEM	Heating and Cooling		WM-102/WM-401

		-		age and the same of	-	-	and the same of th	-		Contract Contract Contract	
	Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
-	AHU Installation										
	Inspection and access doors are operable and sealed	T	V			X					
Description	Condensate water piping properly connected		V			X		X			_
	Condensate drainage is unobstructed and routed to drain		V			X		71	-	\vdash	
Indicated and a second a second and a second a second and a second and a second and a second and a second an	Fan belt adjusted. Supply Fan (if applicable) (DIRECT ORIVE)	~				X		X			
Harman	Construction filters removed and correct filters installed					X		X			
	Compressor properly connected		V				X	11			
	AHU Electrical										
Ļ	Power available to unit disconnect(s).		1				X				The said
	Power available to unit control panel		/		7		X				
	Proper motor rotation verified on the Supply Fan		V			X	X	X		\dashv	-
	Verify that disconnect(s) is located within sight of the unit it controls		V	1		-	X	Λ	-	-	
	Power available to electric heating coil	V	-	+	\dashv	\dashv	X	\dashv	-	-	-
	AHU Coils/Compressor						A				
No	Condenser water piping properly connected		V		Alexandr II	X					
	AHU Controls					A	100 TO				Name of the last
	Discharge Air Temperature Sensor installed/wiring complete		1			X		X	X		
	Zone Temperature Sensor installed/wiring complete	7	7	+	-	$\frac{\Lambda}{X}$	-	$\frac{\Lambda}{X}$	$\frac{2}{X}$	-	
	Auxiliary Float Switch installed/wiring complete	1	+	+		$\frac{\hat{x}}{x}$	\dashv	4	4	-	-
-	Control valves operable		7	+	THE PERSON NAMED IN	$\frac{2}{X}$	+	X	-	-	-
	Unit control system operable and verified	-	~	+	-	$\frac{\Delta}{X}$	-	_	V	-	-
	Verify proper location and installation of the thermostat	+		+	_	^	+	4	X	-	\dashv
1	Testing, Adjusting, and Balancing					Λ					
1	TAB Report submitted	PER I				V		V			





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT
EQUIPMENT TAG
SYSTEM

Camp Lejeune - Base Entry Point	
Admin/Classroom WSHP-3	
Heating and Cooling	

Make	Flori		Model Number	AP049		Serial Number		NG	
		Total Cooling	g Capacity	47,500 BTUH		Total Heating Capacity			
SF HP	75	Volts/Amps	208/1	SF CFM	1700	SF ESP (in. wg)).5	
Condens		er GPM etside Air = 220	12		Hot Ga		No		

			As Submi	itted		
Make	Model Numb				Serial Number	
		ing Capacity			Total Heating Capacity	
SF HP Volts/An		S	SF CFM		SF ESP (in. wg)	
Condenser W Comments:	ater GPM				as Reheat (Yes or No)	

Make	CLIMATE MASTER		Model	Number	TTV04	9	Serial Number	5148 28804
		Total Cooli	ng Capac	ity	45.5MG	314	Total Heating Capacity	2140 60804
SF HP	1.0	SF Volts/A			SF CFM	1700	SF ESP (in. wg)	0.57
Condens	The second second second second	GPM	SKR 1	ab ruple	T	Hot Gas	Reheat (Yes or No)	

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Ductwork Installation								12200		
Ductwork complete.		V			V					
Ductwork leak test complete.	+	V		\vdash	X					
Fire dampers, smoke dampers, and access doors installed as required.	1/		_	H	X	_	-			
Ductwork insulated as required.	-	-			X	_	X			
Verify open/closed status of dampers.	+	V			X					
Verify smoke dampers operation.	-	1			X		X	X		
Flexible connectors installed as specified.	~	V		\dashv	X	-	X	\exists	\dashv	





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	11 JULY 2016
EQUIPMENT TAG	Admin/Classroom WSHP-3	LOCATION	Room # 109
SYSTEM	Heating and Cooling	DWG. NO	WM-102/WM-401

Action and in case of the last	Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Designation	AHU Installation										
Symmetry	Inspection and access doors are operable and sealed	T	V			X					
Distance of	Condensate water piping properly connected		V			X		X			-
-	Condensate drainage is unobstructed and routed to drain		V			X					
gatanas	Fan belt adjusted. Supply Fan (if applicable) (DIRECT OFIUE)	V				X		X			
Name and	Construction filters removed and correct filters installed			1		X		X			
L	Compressor properly connected		V			-	X	71			
L	AHU Electrical						21				
L	Power available to unit disconnect(s).		V				X				
	Power available to unit control panel		V	\dashv	\dashv	\neg	X	\dashv	-	\dashv	\dashv
L	Proper motor rotation verified on the Supply Fan		V	7	\dashv	X	X	X	\dashv	+	
L	Verify that disconnect(s) is located within sight of the unit it controls		V	寸	\dashv		X		+	\dashv	-
L	Power available to electric heating coil	1	\dashv	\dashv	\dashv	\dashv	X	\dashv	+	\dashv	-
L	AHU Coils/Compressor						Λ				
L	Condenser water piping properly connected		1	7	All care	X	7	-		-	
L	AHU Controls					A					
L	Discharge Air Temperature Sensor installed/wiring complete		/	T	T	X	7	X	X		
	Zone Temperature Sensor installed/wiring complete		1	\dashv	-	X	-	-	$\frac{\lambda}{X}$	+	-
	Auxiliary Float Switch installed/wiring complete	7	+	+	THE REAL PROPERTY.	$\frac{\alpha}{x}$	+	4	4	+	\dashv
	Control valves operable		7	\dashv	-	X	+	X	+	+	\dashv
	Unit control system operable and verified		7	+	-	X			x	+	-
	Verify proper location and installation of the thermostat	\dashv	1	+	THE OWNER WHEN	$\frac{\hat{x}}{x}$	+	쒸	4	+	-
•	Testing, Adjusting, and Balancing					1					
,	TAB Report submitted		V		DAMES BO	X		X		-	
			. B	- 8		4 2 1	- 6	18 1	- 1	- 1	- 6

Comments:			





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	
EQUIPMENT TAG	
SYSTEM	

Camp Lejeune – Base Entry Point
Admin/Classroom WSHP-4
Heating and Cooling

Make	Flori	da Heat Pump	Model Number	AP035		Serial Number	T	NG
		Total Cooling	Capacity	37,000 BT	UH	Total Heating Capacity		36,700 BTUH
SF HP	50	Volts/Amps	208/1	SF CFM	1200	SF ESP (in. wg)		0.5
Condens	TORSE STATE OF THE PARTY OF THE	er GPM tside Air = 145	9		Hot Ga		No	

			As Submi	tted		
Make		Model Number	T	Serial	Number	
	Total Cool	ing Capacity			Heating Capacity	
SF HP	Volts/Amp	OS .	SF CFM		P (in. wg)	
Condenser W Comments:	ater GPM				eat (Yes or No)	

Make	CLIMATE MASTER		Model Number	171038		alling contractor) Serial Number	514625321
		Total Cooli	ng Capacity	33.6 M	BH	Total Heating Capacity	31106326
The second secon				SF CFM	1186	SF ESP (in. wg)	0.40
Condens	ser Water	GPM	SEK TAB REP	els	Hot Gas	Reheat (Yes or No)	

Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
Ductwork Installation										
Ductwork complete.	-				V					
Ductwork leak test complete.	+	1			X					
Fire dampers, smoke dampers, and access doors installed as required.	-	V	-		X					
Ductwork insulated as required.	V				X		X			
Verify open/closed status of dampers.	-	V			X					
Verify smoke dampers operation.		V			X		X	X	T	
Clouble connect to the state of	V				X		X			
Flexible connectors installed as specified.		1			X				7	





COMMISSIONING CHECK SHEET Water Source Heat Pump PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	11 July 2010
EQUIPMENT TAG	Admin/Classroom WSHP-4	LOCATION	Room # 109
SYSTEM	Heating and Cooling	DWG. NO	WM-102/WM-401

		-	-			-	in the same of the			and the same of th
Pre Functional Checklist Item and Description	NA	Yes	No	Com-Agent	Mechanical	Electrical	TAB	Controls	Cr-Officer	Comment #
AHU Installation										
Inspection and access doors are operable and sealed		V	MISSION UNION		X					
Condensate water piping properly connected		V			X		X		\vdash	-
Condensate drainage is unobstructed and routed to drain	1	V			X		-		\vdash	-
Fan belt adjusted. Supply Fan (if applicable) (DIRECT DELIVE)	V				X		X			
Construction filters removed and correct filters installed	1	V			X		X			_
Compressor properly connected	\top	V	\vdash		71	X	71			
AHU Electrical						1				
Power available to unit disconnect(s).						X				
Power available to unit control panel	_	/		-	-	X			-	_
Proper motor rotation verified on the Supply Fan		V		+	X	X	X		-	_
Verify that disconnect(s) is located within sight of the unit it controls	+	/		\dashv	^	$\frac{\Lambda}{X}$	A		-	-
Power available to electric heating coil	1	H	+	+	\dashv	$\frac{\hat{\mathbf{x}}}{\mathbf{x}}$	-	-	\dashv	-
AHU Coils/Compressor						4		No.		
Condenser water piping properly connected		V			X					
AHU Controls										
Discharge Air Temperature Sensor installed/wiring complete		/			X		V	7/		
Zone Temperature Sensor installed/wiring complete	+	/	-	-	Ĥ	\dashv	-	X	+	-
Auxiliary Float Switch installed/wiring complete	1	-	+		_	+	X	X	+	_
Control valves operable	+	7	-	-	X	+	37	-	4	\dashv
Unit control system operable and verified	+		+	_	X	_	X	77	4	\dashv
Verify proper location and installation of the thermostat	+	/	+	The same of the same of	X X	+	X	X	+	-
Testing, Adjusting, and Balancing					Λ					
TAB Report submitted		/			X		-			
		-	- 6	8	A	8	X	- 4	- 1	- 1

Comments:	





COMMISSIONING CHECK SHEET Ductless Split System/Air Cooled PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	SMARCH 2016	
EQUIPMENT TAG	MDSS-1/MDCU-1	LOCATION	Admin Bldg	
SYSTEM	Ductless Split System	DWG. NO	WM102/WM602	

				As Scheduled				
Indoor Unit Mak	e	LG	Model #	LSN182CE		Serial #		
Outdoor Unit Ma	ake	LG	Model #	LSU182CE	THE RESIDENCE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN TRANSPORT TO THE PERSON NAMED IN THE PERSON	Serial #		
Indoor Unit	Cooling	g Capacity		18,000 BTUH	Volts/Am	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN	N/A	
Outdoor Unit	Heating	g Capacity		18,000 BTUH	Volts/Am	A STATE OF THE PARTY OF THE PAR	208/1	
Indoor Unit CFM		600		Refrigerant 7	Гуре	NS	200/1	
Comments: Indo	or unit rec	eives powe	er through t	field supplied wiring f	rom outdoor	unit		

		As	Submitted			
Indoor Unit Ma	ke	Model #		5	Serial #	
Outdoor Unit M	lake	Model #		The second second second	Serial #	
Indoor Unit	Cooling Capac	ity		Volts/Tota		
Outdoor Unit				Volts/Tota		
Indoor Unit CFI	M		Refrigerant T	The same of the sa	- Z Milpo	
Comments:				7		

		As Installed			
LG	Model #	LSH180HSV4		Serial #	
oor Unit Make LG Model # LSu 180 HSv 4		THE RESERVE OF THE PERSON NAMED IN COLUMN 2 IS NOT THE PERSON NAME	Total Control of Control		
Cooling Ca	pacity		The same of the sa		2081, 0.49
				Annual Control of the	208/1, 15.4A
50	EN TAB REPORT	Refrigerant			4)0A
		1 3 3	-77-		12453
	Cooling Ca	Cooling Capacity SEE TAB REPORT	LG Model # LSU 180HSV4 e LG Model # LSU 20 HSV4 Cooling Capacity SEE TAB REPORT Refrigerant	LG Model # L5 \(\text{Model # L5 \(\mathred{\text{Model # L	LG Model # LSN180HSV4 Serial # e LG Model # LSN180HSV4 Serial # Cooling Capacity Volts/Amps Volts/Amps SER TAB REPORT Refrigerant Type

Pre Functional Checklist Item and Description	NA	Yes	No	Comments
Indoor Unit Installation				
Verify proper location and installation of sensor/thermostat		/		
Condensate installed		./		
Condensate operational		V	-	
Correct filters installed		-		





COMMISSIONING CHECK SHEET Ductless Split System/Air Cooled PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	8 MARCH 2016
EQUIPMENT TAG	MDSS-1/MDCU-1	LOCATION	Admin Bldg
SYSTEM	Ductless Split System	DWG. NO	WM102/WM602

Pre Functional Checklist Item and Description	NA	Yes	No	Comments
Refrigerant piping properly connected		1		
Refrigerant piping properly insulated		V		
Indoor Unit Electrical				
Power available to unit		1		
Power available to unit control panel		/	\neg	
Verify that disconnect is located within sight of the unit it controls		/	_	
Outdoor Unit Electrical				
Power available to unit disconnect.		/		
Power available to unit control panel		/		
Verify that disconnect is located within sight of the unit it controls	-		+	
Outdoor Unit Installation	WEST !			
Check condenser fans for proper rotation				
Outdoor Unit Controls				
Unit safety/protection devices tested	PROPERTY I	/		
Control system and interlocks installed	++	7	_	
Control system and interlocks operational	11	0		

Cc	-			-4-	_
9. #	388	8551	IP.T	m_{S}	7

FROM OUTDOOR SECTION. INDOOR FAIS POWERED VIA WRING





COMMISSIONING CHECK SHEET Ductless Split System/Air Cooled PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

amp Lejeune - Base Entry Point	TEST DATE	8 MARCH ZOILO
DSS-2/MDHP-2	LOCATION	Admin Bldg
uctless Split System	DWG. NO	WM102/WM602
	DSS-2/MDHP-2	DSS-2/MDHP-2 LOCATION

		1000	11 = 11 = 11 = 1	As Scl	neduled				
Indoor Unit Make		LG	Model #		LSN182H	E	Se	rial#	
Outdoor Unit Ma	ke	LG	Model #		LSU182H	E	Total Contract of the last	rial#	
Indoor Unit	Cooling	Capacity		19,50	BTUH	Volts/A	THE OWNER OF THE PERSON		N/A
Outdoor Unit	Heating	Capacity		19,50	BTUH	Volts/A	-		208/1
Indoor Unit CFM		500			Refrigerant	THE RESERVE THE PARTY OF THE PA		NS	2007
Comments: Indoo	or unit rec	eives powe	er through i	field su	pplied wiring	from outdo	or u	nit	

		As	Submitted			
Indoor Unit Ma	ke	Model #	1	T	Serial #	
Outdoor Unit M	lake	Model #			Serial #	
Indoor Unit	Cooling Capa	city		Volts/Total		
Outdoor Unit				Volts/Total		
Indoor Unit CF	M		Refrigerar		ai Aiips	
Comments:				71-		
Comments.						

				As In	stalled				
Indoor Unit Make		Ä	Model #	LON	180HSV4		Serial	#	
Outdoor Unit Mak	ce Lo	G	Model #	The second liverage and the se	180HSV4		Serial		
Indoor Unit	Cooling	g Capacity				Volts/Ar	-	208/	1 6.4A
Outdoor Unit						Volts/Ar		THE OWNER OF TAXABLE PARTY.	
Indoor Unit CFM		SEU TA	B REPORT	_	Refrigerant T			2081 2410A	15.40
Comments:	ALL TH		T PROVID			7,50		-4104	
				American					

Pre Functional Checklist Item and Description	NA	Yes	N _o	Comments
Indoor Unit Installation				
Verify proper location and installation of sensor/thermostat		./		
Condensate installed		1		
Condensate operational		V		
Correct filters installed		1/		ACCUSED TO THE RESIDENCE OF THE PARTY OF THE
		V		

Commissioning Solutions





COMMISSIONING CHECK SHEET Ductless Split System/Air Cooled PRE FUNCTIONAL PERFORMANCE TEST (PFPT)

PROJECT	Camp Lejeune - Base Entry Point	TEST DATE	SMARU! 2016	
EQUIPMENT TAG SYSTEM	MDSS-2/MDHP-2	LOCATION	Admin Bldg	
	Ductless Split System	DWG. NO	WM102/WM602	

Pre Functional Checklist Item and Description	NA	Yes	No	Comments
Refrigerant piping properly connected		V		4
Refrigerant piping properly insulated		V		
Indoor Unit Electrical			\dashv	
Power available to unit	\top	1	\dashv	
Power available to unit control panel	+	1	-	
Verify that disconnect is located within sight of the unit it controls		V		
Outdoor Unit Electrical				
Power available to unit disconnect.		V		
Power available to unit control panel		1	\dashv	
Verify that disconnect is located within sight of the unit it controls	+	V	1	
Outdoor Unit Installation				
Check condenser fans for proper rotation	+	V		
Outdoor Unit Controls				
Unit safety/protection devices tested				
Control system and interlocks installed	++	1	+	
Control system and interlocks operational	++	1	+	

-				_
F .	om	week.	-	don.
V	3111	111	CH	18

FROM OUTDOOR SECTION.

From:

(b)(6)

NAVFAC MIDLANT, ROICC Camp Leieune; (b)(6)

CI; (b)(6)

RIOCC Camp Leieune

(c)

(b)(6)

NAVFAC MIDLANT, ROICC Camp Leieune; (b)(6)

NAVFAC MIDLANT, ROICC Camp Leieune; (b)(6)

NAVFAC MIDLANT, ROICC Camp Leieune; (b)(6)

(C)

(C)

(C)

(D)

(Group III Mqt Superintendent); (b)(6)

Subject: [Non-DoD Source] RE: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS

Date: Thursday, July 21, 2016 16:50:04

Attachments: Certified Report 24887 Main Admin - TAB Report (Typed) 7-20-16 REVISED.pdf

Copy of TRANSMITTAL 1238 TAB - CLEO - REV 2.pdf

The attached information is in support of the HVAC control systems for the CLEO buildings. The re-TAB was performed by Research Air Flo Inc. Attached is the TAB report for the HVAC system in CLEO, REV 2, based on last review; Page 10, Total and return Airflow data for HP-2.

Thank You

(b)(6) / Quality Control Manager |cid:image001.jpg@01CCBFF4.C2CA3920 | 311 Parachute Tower Road, Camp Lejeune, NC 28542

Cell Phone: (b)(6) | Phone: (b)(6) | Fax: |Email (b)(6) | Fax: |Email (c)(6) | Fax: | Fax: |Email (c)(6) | Fax: | Fax: |Email (c)(6) | Fax: | Fax: |Email (c)(6) | Fax: |Email (c

Dragados USA, Inc. is An Equal Opportunity Employer

From: (b)(6)

Sent: Thursday, July 07, 2016 2:32 PM

To (b)(6)

NAVFAC MIDLANT, ROICC Camp Lejeune (b)(6)

(NAVFAC Contract Spec); (b)(6)

NAVFAC MIDLANT, RIOCC Camp Lejeune (b)(6)

Cc (b)(6)

(Group III Mgt.); (b)(6)

(Group III Mgt.); (b)(6)

Subject: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS

Good afternoor (b) / (b)(6) . Attached are the revised TAB test reports for the CLEO building. It was reviewed and signed by my QC Manager. All changes identified by have been made. (b)(6) last comments are included at the end of the attachment. Request (b)(6) review and comment as soon as he is able. I am sending this digitally-only for now. Please advise if you feel hard copy should follow. I recommend sending hard copy for the files once this gets approved. Thanks. R(b)(6)

311 Parachute Tower Road | Camp Lejeune, NC 28542 |

Phone: w (b)(6) | Email:(b)(6)

Dragados USA, Inc. is An Equal Opportunity Employer



5571 PEACHTREE ROAD ATLANTA, GEORGIA 30341 770-452-8292 (Office) 770-455-6209 (Fax)

To:	Group	III Management	Date:		July 19, 20	016		
	2820	West Vernon Avenue	Job: P1:	383 & P1384 - Ne	ew Base Entry -	Main Ad	min and I	Pavilion
	Kinsto	on, NC 28504	Job No:		24887			
Atter	ntion:	(b)(6)	_					
		IIT TO YOU THE FOLLOWING I	1. LETTE	RTS	5. AGE	IPANY S NDA/PF ER: _	ROCEDI	JRES
On s	ubject	job, prepared by	Timothy J Larson	/ Robe	ert Stanley			
Copies	Item Number	Desci	iption	For Engineers Approval	For Your Information Revision	Supplemental	Returning Loaned Material	
	2	Certified Test & Bala	nce Report - Revised	Х	Х			
Rem	arks:	We appreciate your busine	SS.					
cc:			_					
			Sincer	elv.				
				ARCH AIR F	LO, INC.			
					,			
			By:					

5571 Peachtree Road - Atlanta, Georgia 30341
Phone 770.452.8292 - Fax 770.455.6209
www.researchairflo.com



Certified Test, Adjust and Balance Report

Date:	June 9, 2016	
Project TB#:	24887	
Project:	New Base Entry - Main Admin and Pavilion	
Address:	Camp Lejeune, NC	
Architect:	N/A	
Engineer:	CEMS Engineering, Inc.	
	Ladson, SC	
HVAC Contractor:	Group III Management	
	Kinston, NC	



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3	<u>Instrumentation</u>
4	<u>Nomenclature</u>
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6	ERV-1-EF
7	ERV-1 Exhaust Distribution
8	<u>HP-1</u>
9	HP-1 Supply Distribution
10	<u>HP-2</u>
11	HP-2 Sup & Ret Dist.
12	<u>HP-3</u>
13	HP-3 Sup & Ret Dist.
14	<u>HP-4</u>
15	HP-4 Sup & Ret Dist.
16	MDSS-1
17	MDSS-2
18	EF-1 & EF-2 Fan Test
19	EF-3 Fan Test
20	<u>Traverse</u>
21	Electric Heater
22	P-1 & P-2 Pump Test
23	P-3 Pump Test
24	HPWH-1 Heating Coil Test
25	HP-1 & HP-2 Heating Coil Test
26	HP-3 & HP-4 Heating Coil Test
27-32	Curves & Charts

Page	Description
33-34	11X17 Diagram's



				Repor	rt Certification							
Project:	P1383 &	P138	4 - N	-	Entry - Main Admin an	d Pavilion				_ TBi	#:	24887
Specified tolerance	es:											
Air Handling Units	-	5%	/ +	5 %	Air Distribut	tion	-	5%	1	+	5%	
Pumps	-	5%	/ +	÷ 5%	Water Distri	bution	-	5%	1	+	5%	
THE DATA PRESE FINAL ADJUSTME EDITION OF THE N BALANCING OF EI ANY VARIANCES F NOTED IN THE TES	NTS THA IEBB PR NVIRON ROM D	AT HAROCE MEN' ESIG	AVE DU TAL N Q	BEEN (RAL STA SYSTE UANTIT	OBTAINED IN AC ANDARDS FOR T MS. TES, WHICH EXC	CORDAN ESTING, EED NEE	AD BB 1	WIT JUS	H TIN	THE IG, A	CUR	RENT
Submitted and Certif	ied by:				(<mark>b)(6)</mark> NEBB CERTIFIE	D PROFES	SIO	NAL				
Report Certification	Date:	J	July 6	5, 2016	_							
Research Air Flo, I Certification Number: Expiration Date:	nc. <u>32</u> 0 3/31/2018				ature above				3: . 3/:	ICATI 209 31/20	18 /	



Instrumentation Cal	ibration

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Instrument Type	Manufacturer	Model Number	Serial Number	Calibration Date	
Air Data Multimeter	Shortridge	ADM-870	M00920	11/15/2013	
Hydro Data Multimeter	Shortridge	HDM-250	W14002	1/20/2014	
Temp./Humidity Meter	Cooper	SRH77A	041910022	1/27/2014	
Tachometer	Sticht	MT-1B	B1318531P	11/20/2013	
Amp / Volt Meter	Southwire	21030T	1303113838	1/27/2014	
Ultrasonic Flow Meter	Controlotron	1010WDP1	U2202	N/C/R	
Rotating Vane Anemometer	Alnor	RVA801	A02894	11/7/2013	

N/C/R = No Calibration Required



Nomenclature

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Airflow Data						
CFM	=	= Cubic Feet Per Minute				
FPM	=	= Feet Per Minute				
SA	=	Supply Air				
RA	=	Return Air				
OA	=	Outside Air				
EA	=	Exhaust Air				

Air Pressure Data						
TSP	= Total Static Pressure (in.w					
ESP	=	External Static Pressure (in.wc.)				
SP	=	Static Pressure (in.wc.)				
ΔP or DP	=	Differential Pressure				
OTA	=	Open To Atmosphere				

Temperature Data (ºF)			
EAT DB	= Entering Air Temp. Dry Bulb		
LAT DB	=	Leaving Air Temp. Dry Bulb	
EAT WB	=	Entering Air Temp. Wet Bulb	
LAT WB	Ш	Leaving Air Temp. Wet Bulb	
EWT	II	Entering Water Temperature	
LWT	=	Leaving Water Temperature	
ΔT or DT	=	Differential Temperature	

Distribution Data				
CD	=	Ceiling Diffuser		
SD	=	Slot Diffuser		
SG	II	Supply Grille		
LFD	=	Laminar Flow Diffuser		
FG	=	Floor Grille		
RG	Ш	Return Grille		
EG	-	Exhaust Grille		
ES	=	Exhaust Slot		

Waterflow Data				
GPM = Gallons Per Minute				
CHW	=	Chilled Water		
HW	= Hot Water			
CW	=	Condenser Water		
PW	=	= Process Water		

Water Pressure Data			
FT = Feet Of Water Column			
IN	= Inches Of Water Column		
IN HG	IN HG = Inches Of Mercury		
PSI	=	Pounds Per Square Inch	
ΔP or DP	ΔP or $DP = Differential Pressure$		

Electrical Data			
HP	=	Horsepower	
KW	=	Kilowatts	
FLA	=	Full Load Amps	
BHP	=	Brake Horsepower	
VFD	=	Variable Frequency Drive	
ECM	=	Electronically Commutated Motor	
VSM	=	Variable Speed Motor	
VSC	=	Variable Speed Controller	
MSM	=	Multiple Speed Motor	

Miscellaneous			
LT = Light Troffer		Light Troffer	
CSD	=	Continuous Slot Diffuser	
٥F	=	Degrees Fahrenheit	
DD	=	Direct Drive	
HEPA	=	High Efficiency Particulate Air	
BAS	=	Building Automation System	
LSD	=	Linear Supply Diffuser	
RVA	=	Rotating Vane Anemometer	



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 5/25/2016 Tested By: (6)(6)

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
ERV-1-SF	GreenHeck	MV-750-PSC-QD-115	13967587	Mechanical	HPs 2,3,4

	Airflow Data					
	Design Actual					
	Outlet Total	720	726			
	Unit Total	720	726			
SFM	Return	-	1			
	OSA	720	726			

Miscellaneous Data				
SP Setpoint (In.)				
VFD Setting (HZ.)				

Motor / Fan Data				
	Design	Actual		
Average Amps	7.8	5.6		
Average Volts	115	122		
Motor RPM	1350	DD		
Fan RPM	-	DD		
Motor Manuf.	NL			
Motor HP	0.3			
Phase	1			
Motor Frame	NL			
Service Factor	NL			

Drive Data			
Fan Sheave	Direct Drive		
Fan Bore	Dire	ect Drive	
Motor Sheave	Dire	ect Drive	
Motor Bore	Direct Drive		
Belt Size	Direct Drive		
Belt Quantity	Direct Drive		
Center Distance	Direct Drive		
Turns Open**	Direct Drive		
Motor Mount	Inches In	-	
Adjustment	Inches Out	-	

** Applies to variable pitch sheaves

Traverse Data (Inside Dimensions)						
Service	HP-2 OSA	HP-3 OSA	HP-4 OSA			
Width	8.0	8.0	8.0			
Height	8.0	8.0	8.0			
Ø Dia.	-	-	-			
Area (ft²)	0.56	0.44	0.44			
Actual FPM	631	512	336			
Design FPM	634	500	330			
S.P. (in.wc.)	.05	13	0.0			

τυ		Design	Actual
В	Total	27637	25025
oling	Sensible	6920	6586
ဝိ			

Static Pressure Profile Data										
MIX	KING BC	-	Wheel o	0	0		0	0	SUPPLY AIR	
RETU			В			F				
A	В	С	D	E	F	G	Н	1	J	
Exte			_	- Actual 0.43	To		Desig	gn A	0.19 Actual 1.18	
	RETU A -0.24 Exte	RETURN AIR	MIXING BOX RETURN AIR A B C -0.24 External Design	MIXING BOX RETURN AIR A B C O J J J J L J L L L L L L L	MIXING BOX RETURN AIR A B C D E -0.24	MIXING BOX O	MIXING BOX Part	MIXING BOX RETURN AIR A B C D E F G H -0.24 0.99 External Design Actual Total Design	MIXING BOX Page Page Page Page Page Page Page	

			A	ppara	tus Co	Flow Co	ontrol Dev	/ice Data					
-	Service	Enteri	ing Air	Leavi	ng Air	Wat	Water °F Coil GPM		Manufacturer		-		
Summer	Heat Wheel	db °F	wb °F	db ⁰F	wb °F	Ent.	Lvg.	ΔP'	GFINI	Туре	Size"	Position	ΔΡ
mm	Design	90.0	79.0	81.1	70.0	-	-	-	-	-	-	-	-
S	Actual	88.7	78.0	80.3	69.8	-	-	-	-	-	-	-	-
	Service	Enteri	ing Air	Leavi	Leaving Air		Water °F		GPM	Manufacturer		-	
Winter	Heat Wheel	db °F	wb °F	db ⁰F	wb °F	Ent.	Lvg.	ΔP'	GPIVI	Туре	Size"	Position	ΔΡ
Win	Design	23.0	19.3	49.6	41.1	-	-	-	-	-	-	-	-
	Actual	-	-	•	-	-	-	-	-	-	-	-	-



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 6/8/2016 Tested By:

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
ERV-1-EF	GreenHeck	MV-750-PSC-QD-115	13967587	Mechanical 109	Exhaust Bathrooms

	Airflow Data									
	Design Actual									
	Outlet Total	500	505							
	Unit Total	500	505							
SFM	Return	-	-							
	OSA	-	1							

Miscella	Miscellaneous Data							
SP Setpoint (In.)	-							
VFD Setting (HZ.)	-							

Motor /	Fan Data			
	Design	Actual		
Average Amps	7.8	6.2		
Average Volts	115	122		
Motor RPM	1350	DD		
Fan RPM	-	DD		
Motor Manuf.	٨	IL .		
Motor HP	0.	.3		
Phase	1	1		
Motor Frame	٨	IL		
Service Factor	NL			

D	rive Data			
Fan Sheave	Dire	ct Drive		
Fan Bore	Dire	ct Drive		
Motor Sheave	Dire	ct Drive		
Motor Bore	ct Drive			
Belt Size	Direct Drive			
Belt Quantity	Dire	ct Drive		
Center Distance	Dire	ct Drive		
Turns Open**	Dire	ct Drive		
Motor Mount	Inches In	-		
Adjustment	Inches Out	-		

** Applies to variable pitch sheaves

Trave	rse Data (I	nside Dimer	isions)
Service	Exh. In	Exh. In	-
Width	-	-	-
Height	-	-	-
Ø Dia.	6.0	10.0	-
Area (ft²)	0.20	0.55	-
Actual FPM	265	822	-
Design FPM	250	818	-
S.P. (in.wc.)	02	27	-

īυ		Design	Actual
g B	Total	45382	42109
olin	Sensible	6912	6436
ပိ			

				Static	Pressure	Profile	Data			
-	ı	CING BC	'	Wheel	0	0	<u></u>	0	0	SUPPLY AIR
	KETU	RN AIR	A	B	C D	E	F	G H	I	J
	Α	В	С	D	E	F	G	Н	- 1	J
Vc.)	-0.30	-	-	-	-	-1.21	-	-	-	0.50
(in.v			_	Actual 0.80		otal tatic	Desig		1.71	

	Apparatus Coil Data									Flow Control Device Data				
	Service	Enteri	ng Air	Leavi	ing Air	Wate	er °F	r°F Coil		Manufacturer		-		
mel	Heat Wheel	db °F	wb °F	db ⁰F	wb °F	Ent.	Lvg.	ΔP'	RH%	Туре	Size"	Position	ΔΡ	
Summer	Design	75.0	50.0	87.8	76.9	-	-	-	50.0	-	-	-	-	
S	Actual	71.8	48.9	83.6	74.6	-	-	-		-	-	-	-	
	Service Entering Air Le		Leavi	Leaving Air Water		er °F	Coil		Manufacturer	-				
ter	Heat Wheel	db °F	wb °F	db ⁰F	wb °F	Ent.	Lvg.	ΔP'	RH%	Туре	Size"	-	ΔΡ	
Winter	Design	68.0	35.0	29.6	25.2	_	-	-	-	-	-	-	-	
	Actual	1	-	-	-	-	-	-	-	-	-	-	-	



Air Distribution Test Report Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887 6/8/2016 Tested By: Test Date: Design CFM Unit No. Service Dwg No. WM102 Actual CFM ERV-1 Exhaust 500 505 Grille Design Data Initial Data Final Data Code/ Free Area Size Note Served Number Type Area **CFM** 124 1 EG 6"Ø *50* 31 49 123 EG 6"Ø 50 33 53 103 3 EG 6"Ø *50* 83 52 105 4 EG 8"Ø 150 121 148 5 EG 8"Ø 150 150 107 121 EG 6"Ø *50* 53 110 141

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 3/8/2016 Tested By:

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-1	ClimateMaster	TTV049	S14828806	Mechanical 131	Classroom 129

Airflow Data								
Design Actual								
	Outlet Total	1450	1500					
1	Unit Total	1450	1515	(2)				
SFM	Return	1300	1371					
	OSA	150	145					

Miscellaneous Data							
SP Setpoint (In.)	-						
VFD Setting (HZ.)	-						

Motor / Fan Data							
	Design Actual						
Average Amps	6.9	2.6					
Average Volts	240	212					
Motor RPM	NL Med-Hi						
Fan RPM	-	Med-High					
Motor Manuf.	U.S. I	Motor					
Motor HP	1	.0					
Phase		1					
Motor Frame	NL						
Service Factor	٨	IL					

	, ,										
	Static Pressure Profile Data										
	MIX BOX	IING X		O DX Coil O	0	0	(i)	0	0	SUPPLYAIR	\Diamond
	RETU	RN AIR	 A		 	E	F	G H		J	
(;	A -0.23	В	С	D	E	-0.42	G	Н	- 1	J 0.33	
in.wc.	Exte	rnal	Desig	in A	ctual		otal	Desig	an A	ctual	
(ii)	Sta		0.50		0.40		atic	-		0.57	
											ı

D	Drive Data						
Fan Sheave	Dire	ect Drive					
Fan Bore	Dire	ect Drive					
Motor Sheave	Dire	ect Drive					
Motor Bore	Motor Bore Direct Drive						
Belt Size	Direct Drive						
Belt Quantity	Dire	Direct Drive					
Center Distance	Dire	ect Drive					
Turns Open**	Dire	ect Drive					
Motor Mount	Inches In	-					
Adjustment	Inches Out	-					
** Applies to	** Applies to variable pitch sheaves						

Trave	Traverse Data (Inside Dimensions)										
Service	Sup 1-6	Return	OSA								
Width	-	-	-								
Height	-	-	-								
Ø Dia.	16.0	16.0	8.0								
Area (ft²)	1.40	1.40	0.35								
Actual FPM	1011	979	415								
Design FPM	1036	929	429								
S.P. (in.wc.)	.29	21	.05								

ти		Design	Actual
g B	Total	37000	39132
olin	Sensible	27000	26670
ပိ			

	Apparatus Coil Data								Flow Co	ntrol Dev	rice Data		
Γ.	Service						er ºF	Coil	GPM	Manufacturer		Flow Desigi	1
	DX	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFW	Туре	Size"	Position	ΔΡ
Ş	Design	78.0	65.0	60.8	56.8	-	-	-	12.0	Auto Flow	-	-	2-32
	Actual	65.8	57.9	49.5	48.2	70.2	76.3	15.7	12.0	Auto Flow	1.50	-	7.0

- 1) Speed section 3 with CFM Adjust on +5%
- 2) Unit total is sup 1-6 traverse with grille 7-8 added.



Air Distribution Test Report Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887 6/8/2016 Test Date: Tested By: Unit No. Service HP-1 Dwg No. WM102 Design CFM 1450 Actual CFM Supply 1500

Area	Grille	Code/	0.1	Free	Desig	n Data	Initia	l Data	Final	Data	
Served	Number	Туре	Size	Area	FPM	CFM	FPM	CFM	FPM	CFM	Note
129	1	SG	14x4	0.22	955	210	738	162	986	217	
129	2	SG	14x4	0.22	1091	240	800	176	1127	248	
129	3	SG	14x4	0.22	955	210	743	163	977	215	
129	4	SG	14x4	0.22	1091	240	943	207	1136	250	
129	5	SG	14x4	0.22	955	210	1023	225	995	219	
129	6	SG	14x4	0.22	1091	240	964	212	1141	251	
132	7	CD	6"Ø	*	*	50	*	131	*	48	
130	8	CD	6"Ø	*	*	50	*	124	*	52	

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

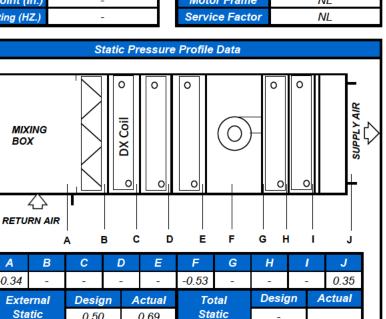
Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion **TB#:** 24887

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-2	ClimateMaster	TTV038	S14625322	Mechanical 109	Conference 120

Airflow Data									
	Design Actual								
	Outlet Total	1020	1016						
	Unit Total	1020	1061						
FIN	Return	665	708						
	OSA	355	353						

Miscellaneous Data					
SP Setpoint (In.)	-				
VFD Setting (HZ.)	-				

Motor / Fan Data							
	Design	Actual					
Average Amps	3.9	2.2					
Average Volts	240	209					
Motor RPM	NL High						
Fan RPM	-	High					
Motor Manuf.	U.S.	Motor					
Motor HP	0.	.5					
Phase	1	1					
Motor Frame	NL						
Service Factor	NL						



Drive Data						
Fan Sheave	Direct Drive					
Fan Bore	Dire	ect Drive				
Motor Sheave	Direct Drive					
Motor Bore	Direct Drive					
Belt Size	Direct Drive					
Belt Quantity	Dire	ect Drive				
Center Distance	Dire	ect Drive				
Turns Open**	Direct Drive					
Motor Mount	Inches In	-				
Adjustment	Inches Out	-				

** Applies to variable pitch sheaves

Trave	Traverse Data (Inside Dimensions)										
Service	Supply	Return	OSA								
Width	-	-	8.0								
Height	-	-	10.0								
Ø Dia.	14.0	14.0	-								
Area (ft²)	1.07	1.07	0.56								
Actual FPM	992	662	631								
Design FPM	953	621	634								
S.P. (in.wc.)	.35	.34	05								

ти		Design	Actual
g B	Total	40100	37862
oling	Sensible	21400	23147
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	Apparatus Coil Data							Flow Control Device Data							
	Service	Enteri	Entering Air		Leaving Air W		er °F Coil		Water °F		GPM	Manufacturer		Flow Desigi	7
ling	DX	db ⁰F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFM	Туре	Size"	Position	ΔΡ		
300	Design	77.0	60.8	57.6	46.2	-	-	-	9.0	-	-	-	2-32		
)	Actual	70.4	56.4	50.2	42.0	70.3	77.9	7.2	9.0	Auto Flow	1.50	-	6.3		

Remarks:

OSA C

0.50

0.69

¹⁾ Speed section 4 with CFM adjust on -5%



Air Distribution Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 6/7/2016 Tested By: 6)(6)

Unit No.	HP-2	2 8	ervice	Supply	Dwg No.	WM102	Desig	n CFM	1020	Actual CFM	1016
Area Served	Grille Number	Code/ Type	Size	Free Area	Desig FPM	n CFM CFM	Initia FPM	I Data CFM	Fir FPM	nal Data CFM	Note
121	1	CD	8"Ø	*	*	130	*	116	*	124	
121	2	CD	8"Ø	*	*	130	*	110	*	132	
120	3	CD	8"Ø	*	*	155	*	134	*	160	
120	4	CD	8"Ø	*	*	150	*	129	*	155	
103	5	CD	6"Ø	*	*	45	*	110	*	47	
104	6	CD	8"Ø	*	*	170	*	133	*	163	
105	7	CD	6"Ø	*	*	120	*	139	*	115	
107	8	CD	6"Ø	*	*	120	*	111	*	120	

Unit No.	HP-2	2	Service	Return	Dwg No.	WM102	Desig	n CFM	665 A	ctual CFM	685
Area Served	Grille Number	Code/ Type	Size	Free Area	Desig FPM	n CFM CFM	Initia FPM	l Data CFM	Final FPM	l Data CFM	Note
121	1	RG	8"Ø	*	*	215	*	137	*	219	
120	2	RG	8"Ø	*	*	250	*	264	*	262	
125	3	RG	8x6	*	*	200	*	260	*	204	
		·									
						·					

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: _____ 6/8/2016 ____ Tested By: ____

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-3	ClimateMaster	TTV049	S14828804	Mechanical 109	Office 114

	Airflow Data									
	Design Actual									
	Outlet Total	1700	1700							
1	Unit Total	1700	1765							
CFM	Return	1480	1540							
	OSA	220	225							

Miscellaneous Data						
SP Setpoint (In.)	-					
VFD Setting (HZ.)	-					

Motor / Fan Data							
	Design	Actual					
Average Amps	6.9	3.4					
Average Volts	240	207					
Motor RPM	NL High						
Fan RPM	-	High					
Motor Manuf.	U.S.	Motor					
Motor HP	1.	.0					
Phase	1	1					
Motor Frame	NL						
Service Factor	٨	IL					

Motor / Fan Data				D	Drive Data		
	Design	Actual		Fan Sheave	Dire	ect Drive	
verage Amps	6.9	3.4		Fan Bore	Dire	ect Drive	
verage Volts	240	207		Motor Sheave	Dire	ect Drive	
Motor RPM	NL	High	(1)	Motor Bore	Dire	ect Drive	
Fan RPM	-	High		Belt Size	Dire	ect Drive	
lotor Manuf.	U.S. I	Motor		Belt Quantity	Direct Drive		
Motor HP	1.	0		Center Distance	Direct Drive		
Phase	1	1		Turns Open**	Direct Drive		
lotor Frame	NL			Motor Mount	Inches In	-	
ervice Factor	NL			Adjustment	Inches Out	-	
			•	** Annlies to	variable nitch	eheavee	

' Applies to variable pitch sheaves

	Static Pressure Profile Data										
osso	Bo	∰ IRN AIR	T	OX Coil		O O E		G H		SUPPLYAIR	¢
	Α	В	С	D	E	F	G	Н	- 1	J	
(in.wc.)	-0.22	-	-	-	-	-0.91	-	-	-	0.35	
(in.)	Exte	ernal	Desig	ın	Actual	То	tal	Desig	gn A	Actual	
	Sta	atic	0.50		0.57	Ste	atic	-		1.26	

Service Supply Return OSA Width - - 8.0 Height - - 8.0 Ø Dia. 18.0 18.0 - Lead (18.2) 1.77 0.44 -	Traverse Data (Inside Dimensions)								
Height - - 8.0 Ø Dia. 18.0 18.0 -	Service	Supply	Return	OSA					
Ø Dia. 18.0 18.0 -	Width	-	-	8.0					
	Height	-	-	8.0					
4.77 4.77 0.44	Ø Dia.	18.0	18.0	-					
Area (11 1.77 0.44	Area (ft²)	1.77	1.77	0.44					
Actual FPM 997 870 512	Actual FPM	997	870	512					
Design FPM 960 836 500	Design FPM	960	836	500					
S.P. (in.wc.) .351613	S.P. (in.wc.)	.35	16	13					

тυ		Design	Actual
g B	Total	47500	45511
olin	Sensible	39200	37552
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	Apparatus Coil Data							Flow Control Device Data					
	Service	Enteri	ing Air	Leavi	ng Air	Wat	er ºF	Coil	GPM	Manufacturer		Flow Desigr	7
ling	DX	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFW	Туре	Size"	Position	ΔΡ
300	Design	77.0	59.7	55.6	49.5	-	-	-	12.0	-	-	-	2-32
)	Actual	69.5	52.4	49.8	41.5	70.3	77.1	11.5	12.0	Auto Flow	1.50	-	4.0

¹⁾ Speed tap setting 4, with CFM adjust at +5%



Air Distribution Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 6/7/2016 Tested By: (b)(6)

Unit No.	HP-S	3 S	ervice	Supply	Dwg No.	WM102	Desig	n CFM	1700	Actual CFM	1700
Area Served	Grille Number	Code/ Type	Size	Free Area	Desig FPM	n CFM CFM	Initia FPM	l Data CFM	Fil FPM	nal Data CFM	Note
125	1	SG	10X3	0.11	1091	120	864	95	1055	116	
119	2	SG	12X4	0.18	1028	185	906	163	1072	193	
118	3	SG	12X4	0.18	1028	185	1078	194	1050	189	
117	4	SG	12X4	0.18	1028	185	817	147	1000	180	
116	5	SG	12X4	0.18	1028	185	956	172	1028	185	
113	6	SG	12X3	0.14	893	125	807	113	900	126	
113	7	SG	12X3	0.14	893	125	786	110	879	123	
114	8	SG	12X3	0.14	1000	140	1100	154	993	139	
114	9	SG	12X3	0.14	1000	140	964	135	1014	142	
115	10	SG	12X4	0.18	1028	185	1061	191	1006	181	
125	11	SG	10X3	0.11	1136	125	1418	156	1145	126	

Unit No.	HP-3	3 S	ervice	Return	Dwg No.	WM102	Desig	n CFM	1480	Actual CFM	1484
Area Served	Grille Number	Code/ Type	Size	Free Area	Desig FPM	n CFM CFM	Initia FPM	l Data CFM	Fin FPM	al Data CFM	Note
119	1	RG	8X6	0.26	654	170	535	139	665	173	
118	2	RG	8X6	0.26	654	170	542	141	638	166	
117	3	RG	8X6	0.26	654	170	604	157	662	172	
116	4	RG	8X6	0.26	654	170	708	184	650	169	
115	5	RG	8X6	0.26	654	170	588	15 3	673	175	
114	6	RG	10X6	0.34	765	260	874	297	794	270	
125	7	RG	12X8	0.57	649	370	719	410	630	359	·

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 6/7/2016 Tested By: (b)(6)

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-4	ClimateMaster	TTV038	S14625321	Mechanical 109	Waiting 101

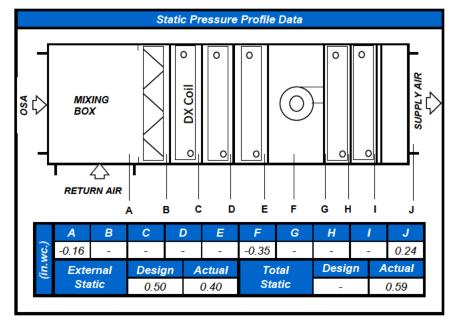
	Airflow Data								
		Design	Actual						
	Outlet Total	1200	1169						
1	Unit Total	1200	1186						
SFM	Return	1055	1037						
0	OSA	145	148						

Miscellaneous Data						
SP Setpoint (In.)	-					
VFD Setting (HZ.)	-					

Motor / Fan Data						
	Design	Actual				
Average Amps	3.9 0.9					
Average Volts	240 212					
Motor RPM	NL	Med				
Fan RPM	- Med					
Motor Manuf.	U.S. Motor					
Motor HP	0.	.5				
Phase	1	1				
Motor Frame	NL					
Service Factor	٨	IL				

	D	rive Data			
	Fan Sheave	Direct Drive			
	Fan Bore	Direct Drive			
	Motor Sheave	Direct Drive			
(1)	Motor Bore	Direct Drive			
	Belt Size	Direct Drive			
	Belt Quantity	Direct Drive			
	Center Distance	Direct Drive			
	Turns Open**	Direct Drive			
	Motor Mount	Inches In	-		
	Adjustment	Inches Out	-		

** Applies to variable pitch sheaves



Traverse Data (Inside Dimensions)									
Service	Supply	Return	OSA						
Width	ı	-	8.0						
Height	ı	-	8.0						
Ø Dia.	16.0	16.0	-						
Area (ft ²)	1.40	1.40	0.44						
Actual FPM	847	741	336						
Design FPM	857	754	330						
S.P. (in.wc.)	.24	13	0						

гυ		Design	Actual
g B	Total	37000	33623
olin	Sensible	26900	25618
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	Apparatus Coil Data						Flow Control Device Data						
	Service						er ºF	Coil	GPM	Manufacturer		Flow Desigi	7
ling	DX	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFW	Туре	Size"	Position	ΔΡ
300	Design	76.0	58.9	55.2	47.3	-	-	-	9.0	-	-	-	2-32
	Actual	70.9	52.4	50.9	40.3	70.2	78.1	11.7	9.0	Auto Flow	1.50	-	5.2

Remarks:

1) Speed section 3



Air Distribution Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 6/7/2016 Tested By: (b)(6)

Unit No.	HP-4	1 S	Service	Supply	Dwg No.	WM102	Desig	n CFM	1200	Actual CFM	1169
Area Served	Grille Number	Code/ Type	Size	Free Area	Design FPM	n CFM CFM	Initia FPM	I Data CFM	Fii FPM	nal Data CFM	Note
100	1	SG	10x3	0.11	909	100	685	75	889	98	
101	2	SG	14x4	0.22	1136	250	610	134	1113	245	
101	3	SG	14x4	0.22	1136	250	660	145	1084	238	
124	4	CD	6"Ø	*	*	4 5	*	88	*	43	
123	5	CD	6"Ø	*	*	4 5	*	68	*	43	
101	6	SG	10x6	0.24	500	120	4 55	109	481	115	
101	7	SG	10x6	0.24	500	120	540	130	490	118	
102	8	CD	6"Ø	*	*	100	*	71	*	97	
102	9	CD	6"Ø	*	*	100	*	120	*	103	
127	10	CD	6"Ø	*	*	70	*	124	*	69	

Unit No.	HP-4	4 S	ervice	Return	Dwg No.	WM102	Desig	n CFM	1055	Actual CFM	1011
Area Served	Grille Number	Code/ Type	Size	Free Area	Design FPM	n CFM CFM	Initia FPM	l Data CFM	Fina FPM	al Data CFM	Note
101	1	RG	18x10	*	*	630	*	673	*	605	
127	2	RG	10"Ø	*	*	370	*	67	*	353	
127	3	RG	6"Ø	*	*	55	*	175	*	53	
					_		_				

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 3/8/2016 Tested By: (5)(6)

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
MDSS-1	LG	LSN180HSV4	412KAGSQW007	Wall	NMCI / Comm 111

	Airflow Data							
	Design Actual							
	Outlet Total	-	-					
1	Unit Total	600	584					
CFM	Return	600	584					
	OSA	-	-					

Miscellaneous Data					
SP Setpoint (In.)	-				
VFD Setting (HZ.)	-				

Motor / Fan Data							
	Design Actual						
Average Amps	0.4	0.4					
Average Volts	208	208					
Motor RPM	ID High						
Fan RPM	-	High					
Motor Manuf.	II	D					
Motor HP	II	D					
Phase	1	1					
Motor Frame	ID						
Service Factor	ID						

Static Pressure Profile Data										
			O DX Coil O	0	0	(i)		0	SUPPLYAIR	♦
RETU				 	E	F	G F		J	
Α	В	С	D	E	F	G	Н	- 1	J	
-	-	-	-	-	-	-	-	-	-	
		Desig	ın A	ctual			Desig	gn A	ctuaL -	
	RETU A - Exte		MIXING BOX RETURN AIR A B C External Design	MIXING BOX RETURN AIR A B C A B C	MIXING BOX RETURN AIR A B C D E	MIXING BOX RETURN AIR A B C D E A B C D E External Design Actual To	MIXING BOX RETURN AIR A B C D E F A B C D E F External Design Actual Total	MIXING BOX RETURN AIR A B C D E F G H	MIXING BOX RETURN AIR A B C D E F G H I A B C D E F G H I External Design Actual Total Design A	MIXING BOX RETURN AIR A B C D E F G H J A B C D E F G H J External Design Actual Total Design Actual

D	Drive Data					
Fan Sheave	Dire	Direct Drive				
Fan Bore	Dire	ect Drive				
Motor Sheave	Direct Drive					
Motor Bore	Direct Drive					
Belt Size	Direct Drive					
Belt Quantity	Dire	ect Drive				
Center Distance	Dire	ect Drive				
Turns Open**	Direct Drive					
Motor Mount	Inches In	-				
Adjustment	Inches Out	-				

** Applies	to variab	le pitch :	sheaves

Trave	Traverse Data (Inside Dimensions)												
Service	Supply												
Width	30.0												
Height	3.0												
Ø Dia.	-												
Area (ft²)	0.63												
Actual FPM	927												
Design FPM	952												
S.P. (in.wc.)	-												

гυ		Design	Actual
g B	Total	18000	19053
olin	Sensible		15642
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	Apparatus Coil Data								Flow Control Device Data				
	Service	Enteri	ing Air	Air Leaving Air Water °F Coil		GPM	Manufacturer	-					
ling	DX	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFW	Туре	Size"	Position	ΔΡ
300	Design	80.0	63.0	-	52.8	-	-	-	-	-	-	-	-
)	Actual	68.3	55.4	43.5	42.1	-	-	-	-	-	-	-	-



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 3/8/2016 Tested By: (b)(6)

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
MDSS-2	LG	LSN180HSV4	412KACOW003	Wall	Station 206

	Airflow Data										
		Design	Actual								
	Outlet Total	-	-								
_	Unit Total	500	485								
CFM	Return	500	485								
	OSA	-	-								

Miscellaneous Data									
SP Setpoint (In.)									
VFD Setting (HZ.)	-								

Motor.	/ Fan Data					
	Design Actu					
Average Amps	0.4	0.4				
Average Volts	208	209				
Motor RPM	ID	Med				
Fan RPM	-	Med				
Motor Manuf.	ID					
Motor HP	II	D				
Phase	1	1				
Motor Frame	ID					
Service Factor	II	D				

					COLVIDO L'ACTOL								
Static Pressure Profile Data													
		o DX Coil o		0					SUPPLYAIR	♦			
RETU		 A	 3 C	 D	 E	F	 G H	 	J				
Α	В	С	D	E	F	G	Н	- 1	J				
-	-	-	-	-	-	-	-	-	-				
External Static		Desig	n A	ctual			Desig	gn A	Actual				
	MI) BO RETU A - Exte	A B	MIXING BOX RETURN AIR A B C External Design	MIXING BOX RETURN AIR A B C A B C External Design A	MIXING BOX A B C D E External Design Actual	Static Pressure Profile MIXING BOX RETURN AIR A B C D E A B C D E External Design Actual	Static Pressure Profile Data MIXING BOX RETURN AIR A B C D E F A B C D E F External Design Actual Total	Static Pressure Profile Data MIXING BOX RETURN AIR A B C D E F G H	Static Pressure Profile Data MIXING BOX RETURN AIR A B C D E F G H External Design Actual Total Design A	Static Pressure Profile Data MIXING BOX RETURN AIR A B C D E F G H J External Design Actual Total Design Actual			

D	rive Data			
Fan Sheave	Dire	ect Drive		
Fan Bore	Dire	ect Drive		
Motor Sheave	Dire	ect Drive		
Motor Bore	Dire	ect Drive		
Belt Size	Direct Drive			
Belt Quantity	Dire	ect Drive		
Center Distance	Dire	ect Drive		
Turns Open**	Dire	ect Drive		
Motor Mount	Inches In	-		
Adjustment	Inches Out	-		

** Applies to variable pitch sheaves

Trave	rse Data (I	Traverse Data (Inside Dimensions)												
Service	Supply													
Width	30.0													
Height	3.0													
Ø Dia.	-													
Area (ft²)	0.63													
Actual FPM	771													
Design FPM	794													
S.P. (in.wc.)	-													

гυ		Design	Actual
g B	Total	19500	19490
olin	Sensible		15138
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	Apparatus Coil Data								Flow Co	ntrol Dev	ice Data		
	Service	Enteri	ng Air	Leavi	ng Air	Wat	er °F	Coil	GPM	Manufacturer	-		
ling	DX	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	GFW	Туре	Size"	Position	ΔΡ
300	Design	80.0	63.0	-	49.2	-	-	-	-	-	-	-	-
)	Actual	70.4	56.8	41.5	40.4	-	-	-	-	-	-	-	-



Fan Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 3/8/2016 Tested By: (b)(6)

Unit Dat	ta		Notes			
Fan Number	Fan Number EF-1					
Service	Female	e Toilet				
Manufacturer	Pana	sonic				
Model Number	FV-05-1	11VKS1				
Airflow Data	Design	Notes				
CFM (Unit Total)	50	52				
CFM (Connected Load)	-	-				
Pressure Data	Design	Actual	Notes			
Total SP (in.wc.)	0.25	-	(1)			
Suction (in.wc.)	-	-	177			
Discharge (in.wc.)	-	-				
Motor / Fan Data	Rated	Actual	Notes			
Voltage	120	119	Notes			
Amps	0.3	0.1				
Motor RPM	NL NL	DD				
Fan RPM	-	DD				
Motor Manufacturer	11	D				
Motor HP	II	D				
Phase	1	1				
Service Factor	IL	D				
VFD Setting (HZ.)	IL	D				
Drive Da	ta		Notes			
Fan Sheave Size	Direct	Drive				
Fan Bore Size	Direct					
Motor Sheave Size	Direct					
Motor Bore Size	Direct	Drive				
Belt Size	Direct	Drive				
Number Of Belts	Direct	Drive				
Center Distance	Direct	Drive				

, is it	<u> </u>				
Unit Da	Notes				
Fan Number	EF	EF-2			
Service	Male	Toilet			
Manufacturer	Pana	sonic			
Model Number	FV-05-1				
Airflow Data	Design	Actual	Notes		
CFM (Unit Total)	50	51			
CFM (Connected Load)	-	-			
Pressure Data	Design	Actual	Notes		
Total SP (in.wc.)	0.25	-	(1)		
Suction (in.wc.)	-	-			
Discharge (in.wc.)	-	-			
Motor / Fan Data	Rated	Actual	Notes		
Voltage	120	119			
Amps	0.3	0.1			
Motor RPM	NL	DD			
Fan RPM	-	DD			
Motor Manufacturer	II				
Motor HP	11	D			
Phase	1	1			
Service Factor	11	D			
VFD Setting (HZ.)	II	D			
Drive Da	ita		Notes		
Fan Sheave Size	Direct	Drive			
Fan Bore Size	Direct				
Motor Sheave Size	Direct				
Motor Bore Size	Direct				
Belt Size	Direct	Drive			
Number Of Belts	Direct	Drive			

Remarks:

1) Static too low to read.



Fan Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: ______ 3/9/2016 ____ Tested By: _______(b)(6)

Unit Da	Notes			
Fan Number	EF	-3		
Service	Vehic	le Bay		
Manufacturer	Gren	Heck		
Model Number	SEI-12-			
Airflow Data	Design	Actual	Notes	
CFM (Unit Total)	300	311		
CFM (Connected Load)	-	-		
Pressure Data	Design	Actual	Notes	
Total SP (in.wc.)	0.25	-		
Suction (in.wc.)	-	-		
Discharge (in.wc.)	-	-		
Motor / Fan Data	Rated	Actual	Notes	
Voltage	115	119		
Amps	1.6	1.3		
Motor RPM	1550	DD		
Fan RPM	-	DD		
Motor Manufacturer	McN	Iillan		
Motor HP	0.	13		
Phase		1		
Service Factor	٨	IL		
VFD Setting (HZ.)		-		
Drive Da	ta		Notes	
Fan Sheave Size	Direct	Drive		
Fan Bore Size	Direct			
Motor Sheave Size	Direct			
Motor Bore Size	Direct	Direct Drive		
Belt Size	Direct	Drive		
Number Of Belts	Direct	Drive		
Center Distance	Direct	Drive		

, in the state of	U J		
Unit Da	ta		Notes
Fan Number			
Service			
Manufacturer			
Model Number			
Airflow Data	Design	Actual	Notes
CFM (Unit Total)			
CFM (Connected Load)			
Pressure Data	Design	Actual	Notes
Total SP (in.wc.)			
Suction (in.wc.)	-		
Discharge (in.wc.)	-		
Motor / Fan Data	Rated	Actual	Notes
Voltage			
Amps			
Motor RPM			
Fan RPM			
Motor Manufacturer			
Motor HP			
Phase			
Service Factor			
VFD Setting (HZ.)			
Drive Da	ita		Notes
Fan Sheave Size			
Fan Bore Size			
Motor Sheave Size			
Motor Bore Size			
Belt Size			
Number Of Belts			
Center Distance			



		Traverse	Test Report		
Project:	P1383 &	P1384 - New Base Entr	y - Main Admin and Pavilion	TB#:	24887
Test Date:	3/9/2016	Tested By:	/h)/G)		

1					(5)(0)						
Unit Number	Service	Inside Dir	mensions	Inch Ø	ch Ø Area (sq.ft.) FPM CFM		FPM (Notes
Onit Number	Service	Width (in.)	Height (in.)	Dia.	Area (Sq.It.)	Design	Actual	Design	Actual	(in.wc.)	Notes
EF-3	Exhaust	12.4	11.5	_	0.99	303	314	300	311		
OSA											
HP-2	OSA	8.0	10.0	-	0.56	634	631	355	353	0.05	
HP-3	OSA	8.0	8.0	_	0.44	500	512	220	225	-0.13	
HP-4	OSA	8.0	8.0	-	0.44	330	336	145	148		



Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887 Test Date: 3/8/16 - 3/22/16 Tested By:

Unit		KIM	Ø		Vo	lts			An	nps		CFM	Air	Тетр.	(°F)	Mataa
Number		KW	Ø	L1-L2	L1-L3	L2-L3	Avg.	L1	L2	L3	Avg.	CFIVI	Ent.	Lvg.	ΔΤ	Notes
UH-A	Design	2.0	1	208	-	-	208	9.6	-	-	9.6	-	-	-		
ОП-А	Actual	1.9	1	213	-	-	213	8.7	-	-	8.7	536	75.4	86.6	11.2	(1)
UH-B	Design	2.0	1	208	-	-	208	9.6	-	-	9.6	-	-	-		
ОП-В	Actual	1.9	1	213	-	-	213	8.8	-	-	8.8	613	79.1	88.9	9.8	(1)
UH-C	Design	2.0	1	208	-	-	208	9.6	-	-	9.6	-	-	-		
OH-C	Actual	1.8	1	209	-	-	209	8.6	-	-	8.6	470	64.9	77.0	12.1	(1)
UH-D	Design	2.0	1	208	-	-	208	9.6	-	-	9.6	-	-	-		
OH-D	Actual	1.8	1	208	-	-	209	8.7	-	-	8.7	409	59.2	73.1	13.9	(1)
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															
	Design												-	-		
	Actual															

Remarks:

1) CFM Calculated from Delta T



Pump Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 5/27/2016 & 7/1/16 Tested By: (b)(6)

				Mater
				Notes
ta	Pump Number		-1	
Pump Data	Service		nermal	
du	Pump Manuf.	Bell &	Gossett	
Pu	Model Number	90 1.25AA	4.375 BF	
	Serial Number	C19663	6-01 L41	
	Impeller Size (In.)	4.3	375	
a		GI	РМ	Notes
Water Data	Design	46	6.0	
ter	Final		3.0	
Wa	Wide Open		2.0	
		Psi.	Ft.	Notes
	Wide Open ΔP	22.8	52.7	
	No Flow Discharge	56.2	_	
e;	No Flow Suction	25.1	-	
Pressure Data	No Flow Head ΔP	31.1	71.8	
ure	Final Discharge	63.1	-	
SS	Final Suction	39.8	-	
Pre	Final Head ΔP	23.3	53.8	
	Design Head ΔP	_	54.0	
	Pump Off (Psi)	25	5.1	
	ΔP Setpoint (Psi)		-	
		Rated	Actual	Notes
	Motor RPM	3450	DD	
ata	Volts	208	214	
l Dê	Amps	9.1	6.8	
ectrical Data	Corrected FLA	8	.8	
ecti	Motor HP	1	.5	
/El	Phase		1	
Motor / El	Motor Manuf.	Mara	athon	
Mo	Service Factor	1.	30	
	Calculated BHP		.2	
	VFD Setting (HZ.)		-	

	(D)(C)			
				Notes	
	Pump Number	P	-2		
ate	Service	HPWH-	-1 Load		
J dı	Pump Manuf.	Bell & (Gossett		
Pump Data	Model Number	PL-			
1	Serial Number	1BLO	O3LF		
	Impeller Size (In.)		-		
a		GF	РМ	Notes	
Water Data	Design	5.	.0		
ter	Final		.0	(1)	
Wa	Wide Open		.0	. ,	
		Psi.	Ft.	Notes	
	Wide Open ΔP	13.2	30.5		
Pressure Data	No Flow Discharge	70.2	_		
	No Flow Suction	54.9	-		
	No Flow Head ΔP	15.3	35.3		
ure	Final Discharge	66.4	-		
ess	Final Suction	53.2	-		
Pr	Final Head ΔP	13.2			
	Design Head ΔP	1	4.0		
	Pump Off (Psi)	30).3		
	ΔP Setpoint (Psi)		-		
		Rated	Actual	Notes	
	Motor RPM	3300	DD		
ata	Volts	115	121		
I D	Amps	2.1	1.7		
ctrical Data	Corrected FLA	2	.0		
lect	Motor HP	0.	.2		
Motor / Ele	Phase	1	1		
otor	Motor Manuf.	Bell & (Gossett		
Mc	Service Factor	٨	IL		
	Calculated BHP	0.	.1		
	VFD Setting (HZ.)				

Remarks:

1) Actual system pressure is over pump capacity.



 _	 	 		 0.400=	
					=

 Project:
 P1383 & P1384 - New Base Entry - Main Admin and Pavilion
 TB#:
 24887

 Test Date:
 7/1/2016
 Tested By:
 (b)(6)

Pump Test Report

	<u> </u>				
				Notes	
~	Pump Number	Р	-3	(1)	
Pump Data	Service	Recirc			
J dι	Pump Manuf.	Bell &	Bell & Gossett		
un _c	Model Number	NBI	F- 2 2		
	Serial Number	1032			
	Impeller Size (In.)		-		
ě		GI	РМ	Notes	
Nater Data	Design		IL	(1)	
er l	Final		.0	(1)	
Nat	Wide Open		.0		
				Mada	
	Wide Oron AB	Psi.	Ft.	Notes	
	Wide Open ΔP	6.6	15.2		
Pressure Data	No Flow Discharge	57.6	-		
	No Flow Suction	51.0	-		
	No Flow Head ΔP	6.6	15.2		
ıns	Final Discharge	57.6	-		
res	Final Suction	51.0	-		
4	Final Head ΔP	6.6	15.2		
	Design Head ΔP	-	NL		
	Pump Off (Psi)	59	9.9		
	ΔP Setpoint (Psi)		-		
		Rated	Actual	Notes	
	Motor RPM	2940	-		
ata	Volts	115	119		
lectrical Data	Amps	0.8	0.5		
rice	Corrected FLA		-		
lect	Motor HP	0.	12		
Motor / El	Phase		1		
otor	Motor Manuf.	Bell &	Gossett		
Mc	Service Factor	٨	IL		
	Calculated BHP		-		
	VFD Setting (HZ.)		-		

	(B)(C	-		
				Notes
	Pump Number			
Pump Data	Service			
J d	Pump Manuf.			
mm _c	Model Number			
-	Serial Number			
	Impeller Size (In.)			
~		GI	РМ	Notes
Data	Design			
Water Data	Final			
Wat	Wide Open			
		Psi.	Ft.	Notes
	Wide Ones AD	PSI.	FL.	Notes
	Wide Open ΔP			
	No Flow Discharge		-	
Pressure Data	No Flow Suction		-	
e D	No Flow Head ΔP			
ıns	Final Discharge		-	
res	Final Suction		-	
а.	Final Head ΔP			
	Design Head ΔP			
	Pump Off (Psi)			
	ΔP Setpoint (Psi)			
		Rated	Actual	Notes
	Motor RPM			
ata	Volts			
i D	Amps			
ectrical Data	Corrected FLA			
ect	Motor HP			
Motor / Ele	Phase			
tor	Motor Manuf.			
Mo	Service Factor			
	Calculated BHP			
	VFD Setting (HZ.)			

Remarks:

1) P-3 was not able to deliver design GPM at the time of testing



Apparatus Heating Coil Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

 Test Date:
 6/8/2016
 Tested By:
 Rob Stanley

st Date.	0/0/2010		resteur						
U	nit Data		Note						
Unit Number	HPV	HPWH-1							
Service	Lo	Load							
Air Data									
	Design	Actual	Note						
CFM	_	-							
Entering DB (°F)	_	-							
Entering WB (°F,		-							
Leaving DB (°F)		-							
Leaving WB (°F)	_	-							
	Water Data								
	Design	Actual	Note						
GPM	5.0	5.0							
Entering Wtr.(°F		120.0							
Leaving Wtr.(°F		130.2							
Coil ΔP (ft.wc.)	-	13.0							
Flow Cont	trol Device Da	ta	Note						
Manufacturer									
Туре	Туре -								
Size (in.)	-	-							
Position	-								
ΔP ()	_								

Rob Stanley						
L	Jnit I	Data		Note		
Unit Number	Unit Number HPWH-1					
Service		Geoth	nermal			
		Air Data				
		Design	Actual	Note		
CFM		-	-			
Entering DB (°F		-	-			
Entering WB (°F		-	-			
Leaving DB (°F)	-	-			
Leaving WB (°F)					
Water Data						
		Water Data				
		Water Data Design	Actual	Note		
GPM				Note		
GPM Entering Wtr.(°F		Design	Actual	Note		
	=)	Design 4.0	Actual 4.0	Note		
Entering Wtr.(°F	-)	4.0 70.0	4.0 70.1	Note		
Entering Wtr.(°F	-)	4.0 70.0	Actual 4.0 70.1 73.2	Note		
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc.	=) =))	70.0 - 3.0	Actual 4.0 70.1 73.2 3.5			
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc.	=) =))	### Design 4.0 70.0 - 3.0 Device Date	Actual 4.0 70.1 73.2 3.5	Note		
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc. Flow Con	=) :)	Design 4.0 70.0 - 3.0 Device Da	Actual 4.0 70.1 73.2 3.5			
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc. Flow Con Manufacturer Type	=) :)	Design 4.0 70.0 - 3.0 Device Da TACC	Actual 4.0 70.1 73.2 3.5			
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc. Flow Con Manufacturer Type Size (in.)	=) :)	Design 4.0 70.0 - 3.0 Device Da TACC CCUFLO-V	Actual 4.0 70.1 73.2 3.5			
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc. Flow Con Manufacturer Type Size (in.) Position	=) :)	Design 4.0 70.0 - 3.0 Device Da TACC CCUFLO-V 1.00 45.0	Actual 4.0 70.1 73.2 3.5			
Entering Wtr.(°F Leaving Wtr.(°F Coil ΔP (ft.wc. Flow Con Manufacturer Type Size (in.)	=) :)	Design 4.0 70.0 - 3.0 Device Da TACC CCUFLO-V	Actual 4.0 70.1 73.2 3.5			



Apparatus Heating Coil Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 12/01/16 - 2/28/17 **Tested By:**

est Date:1	2/01/16 - 2/28	3/17	Tested I				
Un	nit Data		Note				
Unit Number	HF	P-1	(1)				
Service							
	Air Data						
	Design	Actual	Note				
CFM	1450	1515					
Entering DB (°F)							
Entering WB (°F)	-						
Leaving DB (°F)							
Leaving WB (°F)	-						
	Water Data						
	Design	Actual	Note				
GPM	12.0	12.0					
Entering Wtr.(°F)							
Leaving Wtr.(°F)							
Coil AP (ft.wc.)							
Flow Conti	rol Device Da	ıta	Note				
Manufacturer							
Туре							
Size (in.)	1.50						
Position							
ΔP ()	7.0						
		7.0					

U	nit Data		Note			
Unit Number	HF	(1)				
Service			()			
00,7,00						
	Air Data					
	Design	Actual	Note			
CFM	1020	1061				
Entering DB (°F)					
Entering WB (°F						
Leaving DB (°F)						
Leaving WB (°F						
	Water Data					
	Design	Actual	Note			
GPM	9.0	9.0				
Entering Wtr.(°F)					
Leaving Wtr.(°F)					
Coil AP (ft.wc.)						
			Note			
	Flow Control Device Data					
Manufacturer	Flow De					
Туре	Auto F					
Size (in.)	1.50)				
		-				
Position	-					
	6.3					

Remarks:

1) Season of Maximum Load Heating



Apparatus Heating Coil Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 12/01/16 - 2/28/17 Tested By:

esi Dale.	12/01/16	- 2/20	3/17	Testeu			
U	nit Data			Note			
Unit Number		HF	p-3	(1)			
Service							
	Air Data						
	Des	ign	Actual	Note			
CFM	170	00	1765				
Entering DB (°F)						
Entering WB (°F	5)						
Leaving DB (°F)							
Leaving WB (°F)						
	Water	Data		•			
	Des	ign	Actual	Note			
GPM	12	.0	12.0				
Entering Wtr.(°F)						
Leaving Wtr.(°F)						
Coil AP (ft.wc.)						
Flow Con				Note			
Manufacturer	Flo						
Туре	Α						
Size (in.)		1.50)				
Position		-					
ΔP ()		4.0					

ι	Note				
Unit Number	Н	P-4	(1)		
Service					
	Air Data				
	Design	Actual	Note		
CFM	1200	1186			
Entering DB (°F	5)				
Entering WB (°F	-)				
Leaving DB (°F)				
Leaving WB (°F	5)				
	Water Dat				
	Design	Actual	Note		
GPM	9.0	9.0			
Entering Wtr.(°F					
Leaving Wtr.(°F)				
Coil AP (ft.wc.)				
Flow Con	trol Device D	ata	Note		
Manufacturer	turer Flow Design				
Туре	Auto F				
Size (in.)	1.5	0			
Position	-				
ΔP ()	4.0)			

Remarks:

1) Season of Maximum Load Heating



Curves & Charts

TB#: 24887 Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion

EF 1 4 EF 2

WhisperGreenSelect

Specification Submittal Data / Panasonic Ventilation Fan

Customizable Ventilation Fan/Light shall be low sone ceiling mount rated for continuous run, Costomization Vertication Perforaging aliana below occurring to configuration to the Perforaging Institute (HVI). Fain shall be ENERGY STAPE rated and confident by the Home Vertillating Institute (HVI). Fain shall include energy efficient LED lighting. Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

Motor/Blower:

- Riotor/Blower:

 Enclosed DC brushless motor technology rated for continuous run.

 Fan weritation rates shall be manually adjustable for 50-80-110 CFM,

 Power rating shall be 120 volts and 60 Hz.

 Fan shall be Ut listed for Lukshdower enclosure when used with a GFCI protected circuit and used in insulated ceiling (TYPE LCJ).

 Fan equipped with thermal culoff fuse.

 Removable, pomeanently Jubricated, plug-in motor.

Housing:

- Rust proof paint, galvanized steel body.
 Integrated dual 4" or 6" diameter duct adapter.
 Built-in metal flange provides blocking for penetrations through drywall as an Air Barrier, and assists with the discrease in leakage in the Building Envelope during blower door teating.
- Built in backdraft damper.
- Articulating and expandable installation bracket up to 24°.

Grille:

- Attractive design using Poly Pro material.
- Attaches directly to housing with torsion springs.
 Includes a motion sensor cap for use as a cover when the motion sensor Flug in PlayTM module has not been selected.

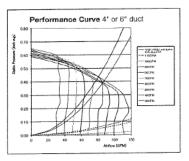
Light:

 Two replaceable, ENERGY STAR® rated, 7W GU24 base LED lamps

Warranty:

· ALL Parts: 3 Years from original purchase da DC Motor: 6 Years from original purchase date. LED: 5 years from original purchase date.

FV-05-11VKSL1



FV-05-11VKSL1

4" or 6" duct

Architectural Specifications:

Architectural Specifications:

Customizable Ventilation FarvLight shall be ceiling mount, ENERGY STAR® rated type with multi-speed control (0, 30-100 CFM, in 10 CFM increments) that shall be built-in with a highylow adjustatio delay himer and activated by a wall switch, Motion Sensor Plag 'N Play' module or Condensation Sensor Plag 'N Play' module. Features a built-in speed selector. Select from S0/80/110 CFM and no more than -0.3/40.3/0.0 sone as a certified by the Home Ventilating Institute (H-Vi) at 0.1 w.g., with no loss than 53/86/114 CFM and no more than 0.3/40.6/10 sones at 25 w.g. Power Consumption shall be no greater than 4.0/60/11.1 waits at 0.1 w.g., and 10.7 m.g., and 10.7 m.g. and 10.0 m.g. and

DC Motor Technology:



When fan senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Location System Exhaust Camp Lejeune, NC



Curves & Charts

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion

TB#: 24887

EF 3

Vari-Green® Motor Options



Benefits

Operates on AC power that's converted to DCproviding a more efficient motor operation as compared

- . The motor can attain up to 85% efficiency and reduce energy consumption.
- Watt savings of 30-70% depending on rpm. Note: As motor speed is turned down, efficiency stays high as compared to an AC motor that decreases dramatically.
- · Operates cooler than a standard AC motor at lower RPMs. A cooler motor has longer motor life and reduces energy consumption.
- 80% usable RPM turndown as low as 300 rpm.
- · SEI fans with Vari-Green motors can provide all the CFM and static pressure ranges of a comparable belt drive.

- · Maintenance costs are reduced as there are no belts or bearings to replace and no pulleys to adjust.
- · Direct drive fans are often preferred where maintenance access is difficult.
- Provides a solution for demand controlled ventilation applications.

Vari-Green Advantages

- · Initial cost is less than a belt drive/motor starter
- Lower operating cost
- · No maintenance, no belts, pulleys or bearings
- · Easy RPM adjustment

		Max	Max		0.0	1100	C	FM/Sta	ic Press	ure in In	ches W	G			
Model Number	Fan RPM	BHP	Sones	0.00	0.05	0.10	0.125	0.15	0,20	0.25	0.30	0.375	0.50	0.625	0.75
	1725	0.044	11.3	511	476	435	387	349	261	220	191				
SE1-8-440	300	0.044	11.3	89											
051.10.110	1725	0.098	11.3	1029	979	921	889	856	792	707					
SE1-10-440	300	0.098	11.0	179											
DE4 40 400	1725	0.070	0.078 14.8	1239	1187	1122	1084	1043	947	828	711	468			
SE1-12-426	300	0.076	14.0	215											
054 40 400	1725	0.26	14.8	1613	1553	1490	1455	1421	1334	1254	1176	1056	888	679	556
SE1-12-432	300	0,20	14.0	281											
054 40 400	1725	0.13	16.7	1621	1570	1513	1471	1429	1346	1230	1073	639			
SE1-12-436	300	0.13	10.7	282											
054.44.400	1725	0.27	7 12.5	2370	2317	2264	2237	2209	2152	2096	2007	1864			
SE1-14-432	300	0.27	12.5	412								ļ			
051 11 100	1725	0.38	16.3	2695	2635	2575	2544	2511	2445	2378	2292	2129	1728	1183	
SE1-14-436	300	0.30	10.0	469											
	1725	0.47	21	2386	2307	2234	2205	2176	2119	2048	1973	1877	1435	1282	1163
SE1-14-440	300	0.47	21	415											
054.40.404	1725	0.36	19	2516	2470	2424	2400	2377	2327	2268	2210	2093	1862		
SE1-16-421	300	0.36	15	438											
054 40 400	1725	0.49	31	3136	3081	3026	2999	2972	2917	2852	2787	2681	2464		
SE1-16-426	300	0.49	31	545								1			
054 46 466	1725	0.61	16.1	3325	3266	3207	3178	3149	3088	3026	2963	2849	2637	2385	1801
SE1-16-428	300	0.61	10.1	578								ļ			
om. 10 100	1725	0.85	21	4019	3956	3894	3863	3832	3766	3697	3629	3526	3262	2790	2214
SE1-16-436	300	0.65	21	699			1								
054 40 404	1725	0.7	17	4164	4090	4017	3980	3943	3859	3768	3676	3519	3157	2826	
SE1-18-424	300	0.7	17	724					Í						
	1725	0.05	22	4816	4737	4658	4618	4578	4489	4382	4274	4113	3817	3342	2860
SE1-18-429	300	0.85	22	838											
	1550	0.61	24	4148	4074	4000	3963	3926	3859	3793	3726	3610	3352		
SE1-20-420	1725	0.01	0.4	4616	4550	4483	4450	4417	4352	4292	4232	4143	3953	3718	
	300	0.84	24	803									İ		

23

Location System Camp Lejeune, NC Exhaust



Curves & Charts Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion **TB#**: 24887 SUBMITTAL ு Be∖ll & Gossett a xylem brand B-141.1 REPRESENTATIVE: James M. Pleasants Co. IOB: Base Entry Point ORDER NO. DATE: 11/25/2013 UNIT TAG: P-1 DATE: SUBMITTED BY: CONTRACTOR: APPROVED BY: 1-1/4AA Series "90" Centrifugal Pumps Vertical In-Line Mounted - Close Coupled MATERIALS OF CONSTRUCTION TYPE OF SEAL SPECIFICATIONS ☐ BRONZE FITTED ☐ ALL BRONZE Standard Seal (Buna-Carbon/Ceramic) FLOW , _____46 (GPM) HEAD __ RPM HP MAXIMUM WORKING PRESSURE ☐ 175 psi (12 bar) W.P. 115/208-230 VOLTS _ PHASE CYCLE ENCLOSURE _ APPROX. WEIGHT PECIALS HEAD (Feet) Design Capacity =46.0 GPM Design Head =54.0 Feet Suction Size = 1,25 ° Suct. Velocity = 9,9 fps Discharge Size = 1,25 " Disc. Velocity = 9,9 fps 100-Min. Imp. Dis. = 3.4375 " Max. Imp. Dis. = 5.25 " Cut Dis. = 4.375 " Max. Flow = 64 GPM B.E.P. Flow = 46 GPM Eff. @ Duty-Point = 52.55 % Motor Size =1.5 HP B.H.P. @ Duty-Point = 1,2 BHP Max. B.H.P. for Imp. Cut = 1,31 BHP 60 Capacity (GPM) Location System Camp Lejeune, NC **Pumps**



Curves & Charts

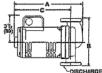
Project: TB#: 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion

SERIES PL - Permanently Lubricated Booster Pumps DIMENSIONS AND WEIGHTS

A-135G

	DIMICHOIDING AIN	J IVEIONIO															
		FLANGE SIZE INCHES			DIMENSIONS - INCHES (mm)							DIMENSIONS - INCHES (mm)					
	MODEL NO.	NPT	MOTOR HP	Α	В	C	D.	E	SHIPPING WT. LBS. (KG)								
_	PL-30	3/4, 1, 1-1/4 & 1-1/2	1/12	8 5/8 (219)	6 3/8 (162)	7 1/8 (181)	4 3/16 (106)	4 3/8 (111)	11.6 (6.3)								
B	PL-38	3/4, 1, 1-1/4 & 1-1/2	1/6	8 5/8 (219)	6 3/8 (162)	7 1/8 (181)	4 3/16 (106)	4 3/8 (111)	13.1 (8.0)								
	PL-45	1, 1-1/4 & 1-1/2	1/6	9 1/8 (232)	8 1/2 (216)	7 1/4 (164)	4 5/8 (117)	4 1/2 (114)	14.5 (6.6)								
	PL-50	1, 1-1/4 & 1-1/2	1/8	9 1/8 (232)	8 1/2 (216)	7 1/4 (184)	4 6/8 (117)	4 1/2 (114)	14.5 (6.6)								
	PL-55	3/4, 1, 1-1/4 & 1-1/2	2/5	9 9/16 (243)	6 3/8 (162)	7 15/16 (202)	4 3/16 (106)	4 3/4 (121)	13.1 (6.0)								
	PL-76	2	1/6	9 15/18 (252)	8 1/2 (216)	7 3/8 (187)	5 3/16 (132)	4 5/8 (117)	18.6 (8.4)								
	PL-130/2"	2	2/5	10 3/4 (273)	8 1/2 (216)	8 1/4 (210)	5 3/16 (132)	5 1/6 (130)	22 (10)								
	PL-130/3"	3	2/5	10 3/4 (273)	8 1/2 (216)	8 1/4 (210)	6 (162)	5 1/8 (130)	27 (12.2)								

Dimensions are approximate and subject to change. Contact factory for certified dimensions.



TYPICAL SPECIFICATIONS

mustrated on the plans and in accordance with the following specifications:

1. The pumps shall be of the horizontal, permanently lubricated type, specifically designed and guaranteed for quiet operation.

2. The pumps shall be of the horizontal permanently subricated type.

- operation.

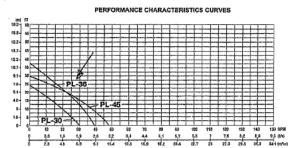
 2. The pumps shall have a steel shaft supported by permanently lubricated, seeled precision ball bearings. The pumps are to be equipped with a water-tight seal to prevent leakage. Mechanical seal faces to be carbon on silicon carbide. The motor shall be non-overloading at any point on the pump performance curve.

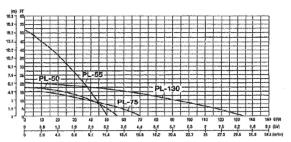
 3. The motor shell be of the drip-proof, sealed precision ball-
- bearing, quiet-operating construction. The permanent split-capacitor motor shall be aquipped with thermal overload

espectitor motor shall be addeduced by the protection.

4. Pumps to be suitable for 225°F (107°C) operating temperature at 150 psig (10 bar) working pressure.

The pumps shall be Bell & Goseett, A Xylem brand. Model No. PL______ with a capacity of _____ GPM at _____ feet of head.





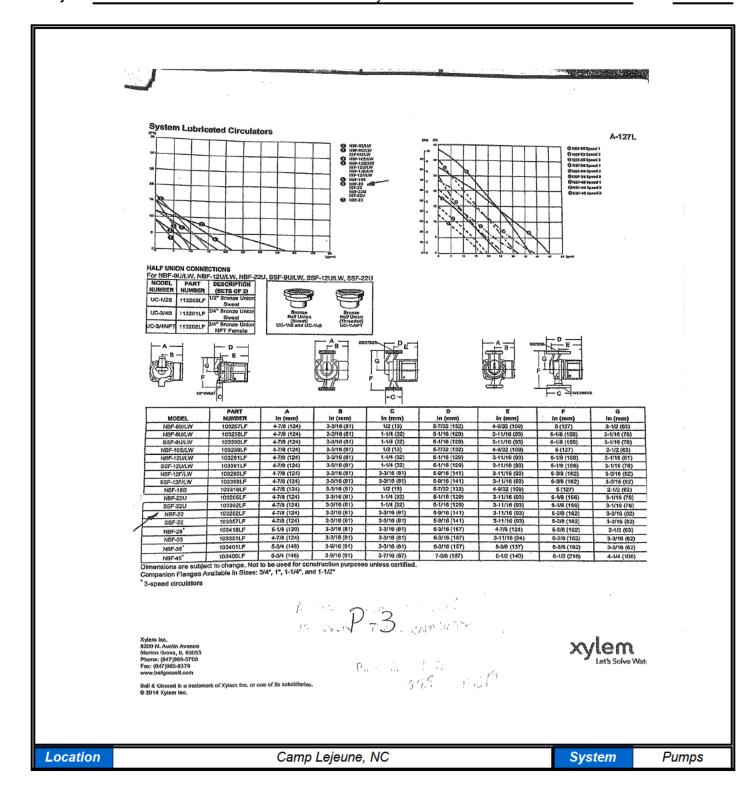
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Location Camp Lejeune, NC System **Pumps**



Curves & Charts

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion **TB#**: 24887





Curves & Charts

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion

TB#: 24887





Refer to the ASHRAE recommendations shown in the chart below. Some designers prefer to use 80 percent of the ASHRAE maximum.

ASHRAE Recommended Maximum GPM

Nominal Size	Туре L Соррег	Sch. 40 Pipe	ASHRAE Criteria
1/2"	2.8	3.8	
3/4"	5,9	6,5	
1"	10	11	Maximum Velocity four feet/sec.
1 1/4"	16	18	iour ieet/sec.
1 1/2"	23	25	
2"	39	41	
2 1/2"	78	72	
3"	130	160	Maximum Loss four feet/100
4	270	275	feet.
6"	775	775	



Two spring ranges are available for all AutoFlow valves: 2 to 32 psi and 5 to 60 psi. The first number is the differential pressure (AP) needed to achieve design flow. The second is the maximum ΔP where the design flow will be maintained. Following are some general rules on the selection of the spring range. In most cases the amount added to the calculated pump head is 4.6 feet (2 psi X 2.3 feet/psi).

- For direct return systems, if the total pump head is less than 110 feet, the 2-32 range can generally be used for all units.
- On reverse return systems the 2-32 range can be used for all units.
- For direct return systems with a total pump head exceeding 110 feet, the 5-60 range should be used only on units close to the pump to maintain control.

To calculate the spring range required for a specific terminal unit:

Estimate the losses due to -

- a) pump accessories such as suction diffusers, check valves, etc.
- b) distribution pipe loss to the terminal unit c) terminal coil, ATC, and Y-strainer drops at

design flow. Add a, b, and c and then subtract from the total pump

If less than 74 feet, use the 2-32 range. If greater than 74 and less than 138 feet, use the 5-60 range.

The total pump head is 132 feet and the total of a, b and c is 35 feet, 132 - 35 = 97 Use the 5-60 range since the remaining pump head is greater than 74 feet (32 psi).



Using the chart below, find the available flow according to the size valve required and the system design flow. If the required flow falls between two available flows, round to the nearest flow listed.

Size	PSID	Available Flow Rate (GPM) by Cartridge
1/2-3/4	2 - 32	0.33, 0.5, 0.67, 0.75, 0.88, 1.0, 1.1, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 6.0, 7.0, 8.0
	5 - 60	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12
1"-1 1/4"	2 - 32	0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
	5 - 60	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27
1 1/2-2"	2 - 32	5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50
	5 - 60	8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 80, 62, 64, 66, 68, 70
2 1/2"	2 - 32	9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 56, 60, 64, 68, 72, 76, 80
	5 - 60	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120

Flows for sizes 3"-30" are available in increments of 5 GPM for PSID 2-32 and 5-60, and 10 GPM for PSID 3-20, 5-40

Size	PSID	Max GPM	Siza	PSID	Max GPM	Size	PSID	Max GPM
	2 - 32	135		2 - 32	945		2 - 32	2565
	5 - 60	170		5 - 60	1190		5 - 60	3230
3"	3 - 20	200	8"	3 - 20	1400	14"	3 - 20	3800
	5 - 40	250		5 - 40	1750		5 - 40	4750
	7 - 45	300		7 - 45	2100		7 - 45	5700
	2 - 32	270		2 - 32	1485		2 - 32	4320
	5 - 60	340		5 - 60	1870		5 - 60	5440
4"	3 - 20	400	10~	3 - 20	2200	20"	3 - 20	6400
	5 - 40	500		5 - 40	2750		5 - 40	8099
	7 - 45	600		7 - 45	3300		7 - 45	9600
	2 - 32	540		2 - 32	2025		2 - 32	9450
	5 - 60	680		5 - 60	2550		5 - 60	11900
6"	3 - 20	800	12"	3 - 20	3000	30"	3 - 20	14000
	5 - 40	1000		5 - 40	3750		5 - 40	17500
	7 - 45	1200		7 - 45	4500		7 - 45	21000

NOTE: 5", 16", 18" and 24" flows available, see specific submittal

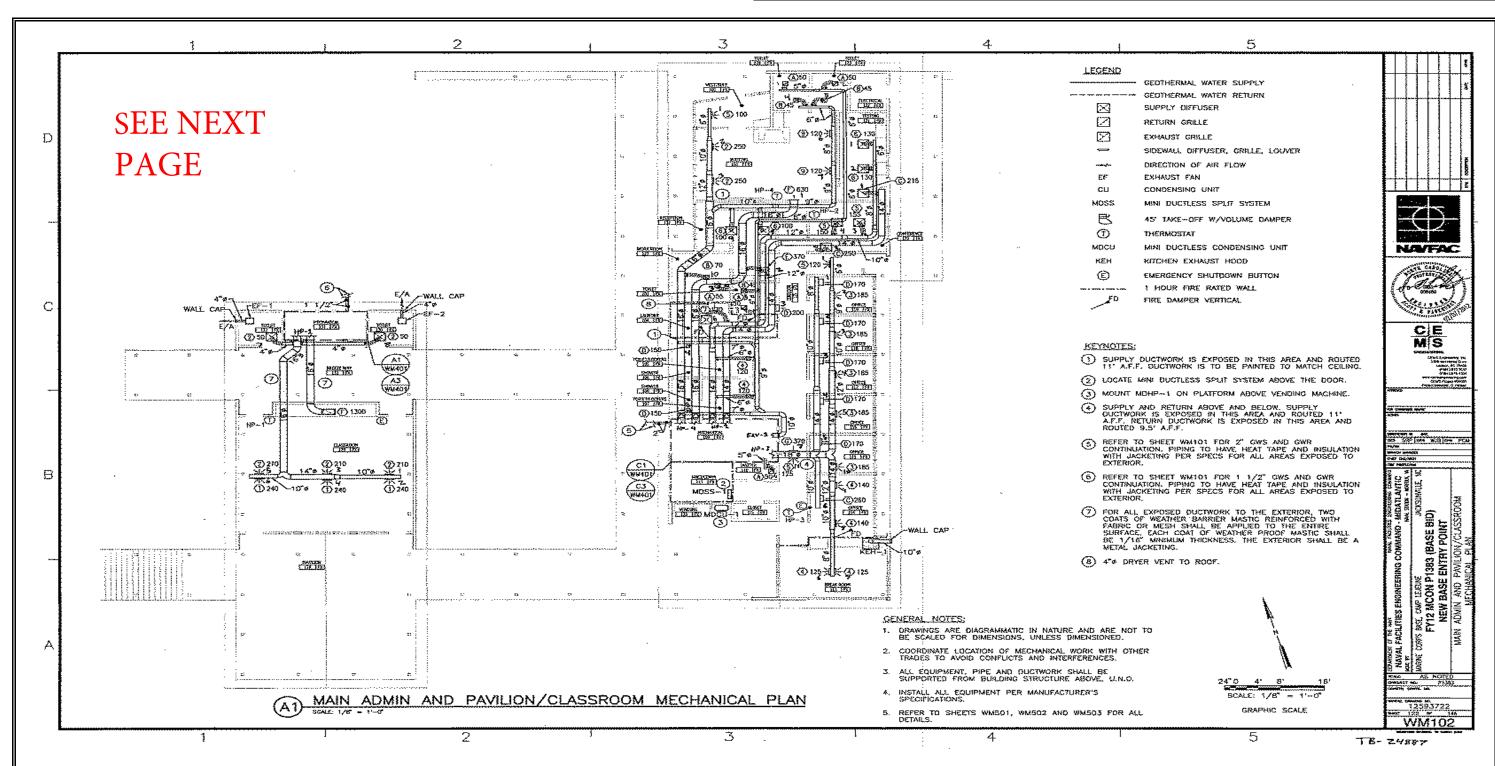
15

Location System Camp Lejeune, NC Valves



	System Diagram		
Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion	TB#:	24887

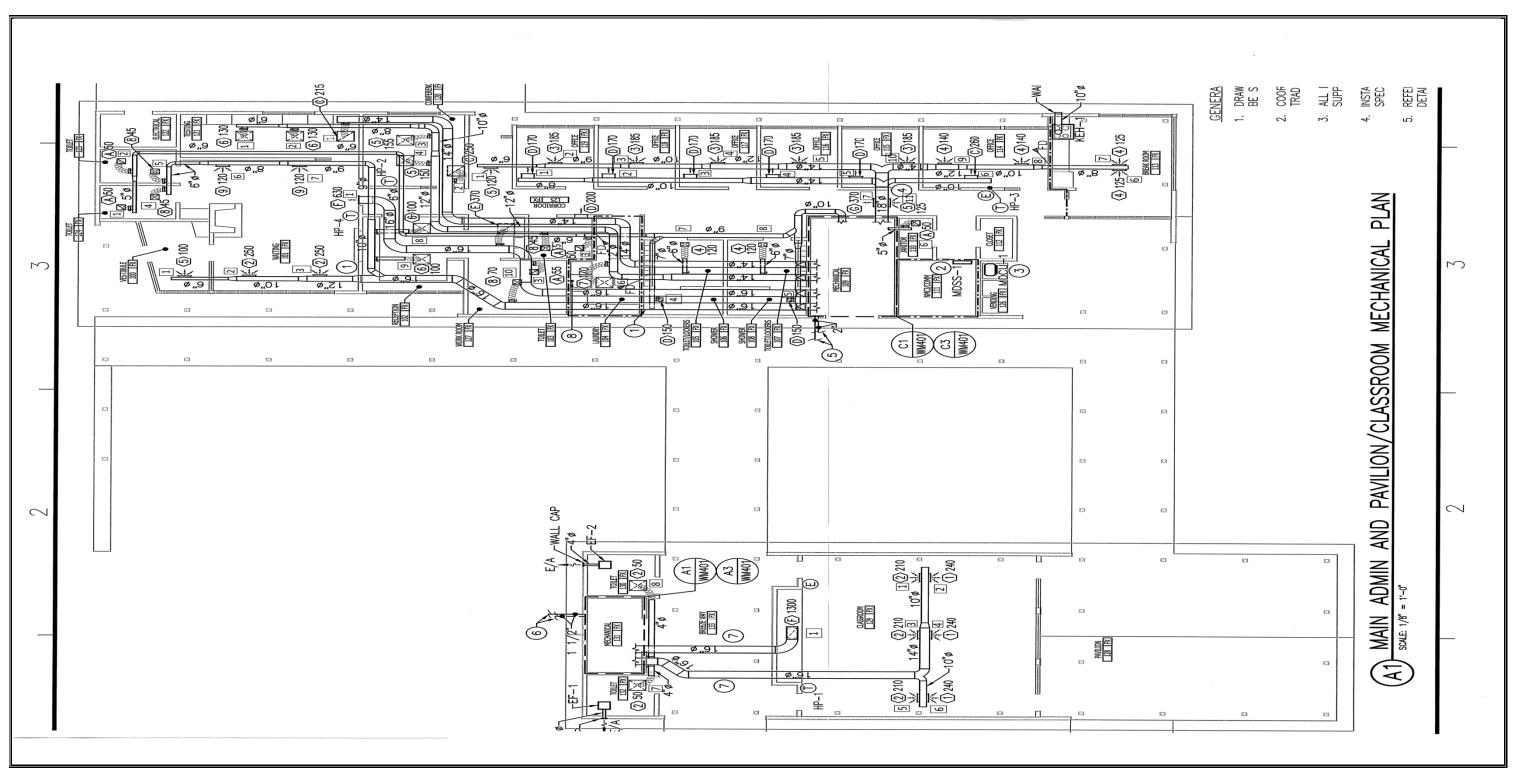
Project Address	Drawing Number	WM102
Camp Lejeune, NC	Floor Plan	Mechanical
	Drawing By	RCH
	System	Supply & Return





	System Diagram		
Project:	New Base Entry - Main Admin and Pavilion	TB#:	24887

Project Address	Drawing Number	WM102
Camp Lejeune, NC	Floor Plan	Mechanical
	Drawing By	RCH
	System	Supply & Return



CONTRACTOR'S SUBMITTAL TRANSMITTAL			CONTRACT NO.	TRANSMITTAL NO. DATE		DATE	
	IV NORFOLK 4-43553		WITT TAL	N40085-12-C-7714	07212016	1238 REV2	7/21/2016
FROM	CONTRACTO(b)(6)	nee L		PROJECT TITLE AND LOCAT			
Draga	idos USA -						
то	(0)			P1383 & P1384 - New Base E	ntry Point and	Road at MCB C	amp Lejeune
Mr (b)	Superviso	ry Construc	tion Manager				
			ONTRACTOR USE ON	Y		REVIE	WER USE ONLY
		*List only	one specification division	n per form		** A	CTION CODES
						A-Approve	d
List only one of the following categories on each transmittal form. D-Disapproved					oved		
		and indic	ate which is being s	submitted		AN-Approv	ved as noted
						RA-Receip	ot acknowledged
Co	ntractor Approved		OICC Approval	Deviatio	n/Substitution	C-Comme	nts
				For C	ICC Approval	R-Resubn	nit
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9				CONTRACTOR REPRESENTATI	VE (Signature)		
·					Two		
DATE F	RECEIVED BY REVIEWER		FROM (Reviewer)		то		
П				n does not include approval of any	deviation from	the	
	-		actor calls attention to and				
				indicated in REVIEWER USE ON	Y Section and i	n comments	
DEV//E	below on ONE COPY of	me transmittal	IVIII.				
REVIE	WER'S COMMENTS						
COPIES	то:		DATE		SIGNATURE		
	C (2)						
LAN*	TDIV (1)						

From: NAVFAC MIDLANT, ROICC Camp Lejeune To: NAVFAC MIDLANT, CI (b) (6 NAVFAC MIDLANT, ROICC Camp Lejeune; (b) (6) NAVFAC MIDLANT, RIOCC Camp Lejeune; (b) ROICC Camp Lejeune; NAVFAC MIDLANT, ROICC Camp Lejeune ROICC Camp Lejeune; (b) (6)
NAVFAC MIDLANT, ROICC Camp Lejeun (Group III Mgt.) (b) (6) (PM, Group III Management); Cc: (Group III Mgt Superintendent): Subject: RE: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS Date: Monday, July 11, 2016 10:04:17 /A11 will be onsite to do TAB and controls verification July 25th and 26th, and the morning of the 27th if necessary. Please have the appropriate subs on site. (b)(6)PE Supervisory Construction Manager ROICC, Camp Lejeune, NC ----Original Message-----[mailto(b)(6) Sent: Thursday, July 07, 2016 2:32 PM NAVFAC MIDLANT, NAVFAC MIDLANT, ROICC Camp Lejeune: (b) (6 NAVFAC MIDLANT, ROICC Camp Lejeune; NAVFAC CI; MIDLANT, RIOCC Camp Lejeune (Group III Mgt.); (b) (6) (PM, Group III Management):(b)(6) (Group III Mgt Superintendent): (b) (6 Subject: [Non-DoD Source] TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS . Attached are the revised TAB test reports for the CLEO building. It was reviewed and signed by my QC Manager. All changes identified by have been made. (b)(6) last comments are included at the end of the attachment. Request (b) (6) review and comment as soon as he is able. I am sending this digitally-only for now. Please advise if you feel hard copy should follow. I recommend sending hard copy for the files once this gets approved. Thanks. R/ | Deputy Project Manager & Small Business Liaison | | 311 Parachute Tower Road | Camp Lejeune, NC 28542 | Phone: w (b) (6) | Email: (b) (6)

Dragados USA, Inc. is An Equal Opportunity Employer

From: (b)(6)

To: NAVFAC MIDLANT, ROICC Camp Lejeune; (b)(6) NAVFAC MIDLANT, CI; (b)(6)

NAVFAC MIDLANT, ROICC Camp Lejeune (b) (6) NAVFAC MIDLANT, RIOCC Camp

<u>Lejeune</u>

Cc: (b)(6) PM, Group III Management);

(Group III Mgt Superintendent) (6)

Subject: [Non-DoD Source] TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS

Date: Thursday, July 07, 2016 14:35:17

Attachments: TRANSMITTAL 1238 REV 1, CLEO TAB TEST REPORTS.pdf

Good afternoon (b) (b) (6). Attached are the revised TAB test reports for the CLEO building. It was reviewed and signed by my QC Manager. All changes identified by have been made. (b) (6) last comments are included at the end of the attachment. Request (b) (6) review and comment as soon as he is able. I am sending this digitally-only for now. Please advise if you feel hard copy should follow. I recommend sending hard copy for the files once this gets approved. Thanks. R(b)(6)

(b)(6) | Deputy Project Manager & Small Business Liaison | |

311 Parachute Tower Road | Camp Lejeune, NC 28542 |

Phone: w(b)(6) | c(b)(6) | Email: (b)(6)

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CONTRACTOR'S SUBMITTAL TRANSMITTAL			CONTRACT NO.		TRANSMITT	AL NO.	DATE			
LANTDIV NORFOLK 4-43553 (Rev. 11-80)				N40085-12-C-7714	4	07052016	16 1238 REV1 7/5/2			
	CONTRACTOR				PROJECT TITLE AND	LOCATIO	NC			
Draga	ados USA -									
то				18.	P1383 & P1384 - New	Base Enti	ry Point and I	Road at MCB C	amp Lejeune	
(b)(6)	Superviso	ry Construc	tion Mana	ger						
		С	ONTRACTO	R USE ONL	_Y			REVIEWER USE ONLY		
		*List only	one specifica	ation division	n per form			** A	CTION CODES	
								A-Approve		
	List only or				n each transmittal fo	orm.		D-Disappr		
		and indic	ate which	is being s	submitted				red as noted	
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For OICC Appr PROJ. SPEC. SECT. ITEM IDENTIFICATION NO. 6					CC Approval	R-Resubm				
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A-E	(1)									



5571 PEACHTREE ROAD ATLANTA, GEORGIA 30341 770-452-8292 (Office) 770-455-6209 (Fax)

To:	: Group III Management		Date: July 5, 2016					
	2820	West Vernon Avenue	Job: P1383 & I	1383 & P1384 - New Base Entry - Main Admin at				avilion
	Kinsto	n, NC 28504	Job No:	2	4887		_	
Atter	ntion:							
WE TRANSMIT TO YOU THE FOLLOWING ITE			1. LETTERS 2. REPORTS 3. SURVEY					RES
On s	ubject	job, prepared by(b)(6)		(b)(6)				
Copies	Item Number	Description		For Engineers Approval For Your	Revision	Supplemental	Returning Loaned Material	
	2	Certified Test & Balanc	e Report	хх				
Г			174					
\vdash					T			
Г								
Rem	arks:	We appreciate your business.						
		÷.						
cc:	F=	:						
	·ç i							
			Sincerely,	CH AIR FLO	INC.			
			Ву:					

5571 Peachtree Road - Atlanta, Georgia 30341
Phone 770.452.8292 - Fax 770.455.6209
www.researchairflo.com



Certified Test, Adjust and Balance Report

Date:	June 9, 2016
Project TB#:	24887
Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion
Address:	Camp Lejeune, NC
Architect:	N/A
Engineer:	CEMS Engineering, Inc. Ladson, SC
HVAC Contractor:	Group III Management Kinston, NC



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22	P-1 & P-2 Pump Test
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24	HPWH-1 Heating Coil Test
25	HP-1 & HP-2 Heating Coil Test
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27-32	Curves & Charts

Description
11X17 Diagram



				R	Pepoi	rt C	Certif	cati	on								
Project:	P1383 &	P138	4 -	New	Base	Entr	y - Mair	ı Adm	in an	d Pa	vilion				_ TE	3#:	24887
Specified tolerance	s:																
Air Handling Units	-	5%	1	+	5%		Air	Dist	ribut	ion		-	5%	, /	+	5%	
Pumps	121	5%	1	+	5%		Wa	ter D	istri	buti	on	:=	5%	, /	+	5%	
THE DATA PRESENTINAL ADJUSTMENT EDITION OF THE NUMBALANCING OF ENTITY ANY VARIANCES FOR NOTED IN THE TEST	NTS THA EBB PF IVIRON ROM D	AT H ROCE MEN ESIG	AV EDI ITA	E B URA L S QU	SEEN AL ST SYSTE ANTII	OB AN EMS	TAINE DARD S. S, WH	D IN S FO	I AC OR T EXC	COI EST	RDA FING NE	NCI S, AI	TOI SJU:	TH STII	THE NG,	AND	RRENT
Submitted and Certif	ied by:						NEBE	o)(6) CER	TIFIE	D PI	ROFE	ESSI	ONAI	_		_	
Report Certification	Date:		Jul	y 6, 2	2016												
Research Air Flo, l Certification Number: Expiration Date:		8	■		9	gnai	ture ab	ove					\		3209		



	Instrumentation Calibration									
Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion	TB#:	24887							

Instrument Type	Manufacturer	Model Number	Serial Number	Calibration Date	
Air Data Multimeter	Shortridge	ADM-870	M00920	11/15/2013	
Hydro Data Multimeter	Shortridge	HDM-250	W14002	1/20/2014	
Temp./Humidity Meter	Cooper	SRH77A	041910022	1/27/2014	
Tachometer	Sticht	MT-1B	B1318531P	11/20/2013	
Amp / Volt Meter	Southwire	21030T	1303113838	1/27/2014	
Ultrasonic Flow Meter	Controlotron	1010WDP1	U2202	N/C/R	
Rotating Vane Anemometer	Alnor	RVA801	A02894	11/7/2013	

N/C/R = No Calibration Required



Nomenclature

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#:

	Airflow Data				
CFM	=: .	Cubic Feet Per Minute			
FPM	-	Feet Per Minute			
SA	=	Supply Air			
RA	=:	Return Air			
OA	=	Outside Air			
FA	=	Exhaust Air			

Air Pressure Data					
TSP	=	Total Static Pressure (in.wc.)			
ESP	=	External Static Pressure (in.wc.)			
SP	=	Static Pressure (in.wc.)			
ΔP or DP	=	Differential Pressure			
OTA	=	Open To Atmosphere			

	Temperature Data (°F)					
EAT DB	=	Entering Air Temp. Dry Bulb				
LAT DB	=	Leaving Air Temp. Dry Bulb				
EAT WB	п	Entering Air Temp. Wet Bulb				
LAT WB	=	Leaving Air Temp. Wet Bulb				
EWT	=	Entering Water Temperature				
LWT	=	Leaving Water Temperature				
ΔT or DT	=	Differential Temperature				

Distribution Data						
CD	=	Ceiling Diffuser				
SD	=	Slot Diffuser				
SG	=	Supply Grille				
LFD	=	Laminar Flow Diffuser				
FG	=	Floor Grille				
RG	=	Return Grille				
EG	=	Exhaust Grille				
ES	=	Exhaust Slot				

NAME OF	Waterflow Data					
GPM	=	Gallons Per Minute				
CHW	=	Chilled Water				
HW	=	Hot Water				
CW	=	Condenser Water				
PW	=	Process Water				

Water Pressure Data					
FT	= ;	Feet Of Water Column			
IN	=	Inches Of Water Column			
IN HG	=	Inches Of Mercury			
PSI	11	Pounds Per Square Inch			
ΔP or DP	=	Differential Pressure			

Electrical Data					
HP	=	Horsepower			
KW	=	Kilowatts			
FLA	=	Full Load Amps			
BHP	=	Brake Horsepower			
VFD	=	Variable Frequency Drive			
ECM	=	Electronically Commutated Motor			
VSM	=	Variable Speed Motor			
VSC	=	Variable Speed Controller			
MSM	=	Multiple Speed Motor			

Miscellaneous					
LT	=	Light Troffer			
CSD	=	Continuous Slot Diffuser			
°F	=	Degrees Fahrenheit			
DD	=	Direct Drive			
HEPA	=	High Efficiency Particulate Air			
BAS	=	Building Automation System			
LSD	=	Linear Supply Diffuser			
RVA	=	Rotating Vane Anemometer			



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

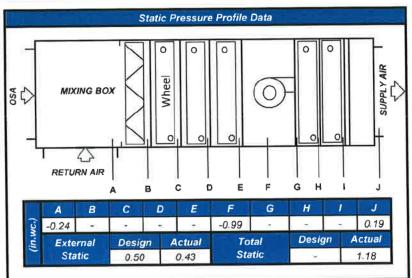
Test Date: ______5/25/2016 Tested By: ______(b)(6

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
ERV-1-SF	GreenHeck	MV-750-PSC-QD-115	13967587	Mechanical	HPs 2,3,4

Airflow Data									
		Design	Actual						
	Outlet Total	720	726						
	Unit Total	720	726						
FM	Return	*	3×						
٦	OSA	720	726						

Miscellaneous Data								
SP Setpoint (In.)								
VFD Setting (HZ.)	×							

Motor /	Fan Data			
	Design	Actual		
Average Amps	7.8	5.6		
Average Volts	115	122		
Motor RPM	1350	DD		
Fan RPM	852	DD		
Motor Manuf.	^	IL		
Motor HP	0	5.6 122 DD DD L 3		
Phase).3 1		
Motor Frame	٨	IL		
Service Factor	٨	IL		



D	Drive Data							
Fan Sheave	Dire	ct Drive						
Fan Bore	Dire	Direct Drive						
Motor Sheave	Direct Drive							
Motor Bore	Direct Drive							
Belt Size	Direct Drive							
Belt Quantity	Dire	ct Drive						
Center Distance	Dire	ct Drive						
Turns Open**	Dire	ct Drive						
Motor Mount	Inches In							
Adjustment	Inches Out	-						

** Applies to variable	pitch sheaves
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Trave	rse Data (II	nside Dimer	sions)	
Service	HP-2 OSA	HP-3 OSA	HP-4 OSA	
Width	8.0	8.0	8.0	
Height	8.0	8.0	8.0	
Ø Dia.	0.	Ð	- 6	
Area (ft2)	0.56	0.44	0.44	
Actual FPM	631	512	336	
Design FPM	634	500	330	
S.P. (in.wc.)	.05	13	0.0	

2		Design	Actual
9 ВТ	Total	27637	25025
ooling	Sensible	6920	6586
ပိ			

		No.	А	ppara	tus Coi	l Data	-5]			Flow C	ontrol De	vice Data		
	Service	Enteri	Entering Air Leav			Water °F		Coil	Coil	Manufacturer	:es			
mer				db °F	wb °F	Ent.	Lvg.	ΔP'	GPM	Туре	Size"	Position	ΔP	
Sumi	Design	90.0	79.0	81.1	70.0	ĕ	(2)	12:			(Fe)	1941		
Š	Actual	88.7	78.0	80.3	69.8	-	-	14		74	181	12	*	
	Service	Enteri	ing Air	Air Leaving Air		Water °F		F Coil	Coil GPM	Manufacturer				
ter	Heat Wheel	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP′	GFW	Туре	Size"	Position	ΔΡ	
Win	Design	23.0	19.3	49.6	41.1	9	2=				-	-	5 m 3	
	Actual	-	725	37		-	- 10	-	- 2	*	*		(*)	



Air Handling Unit Test Report TB#: 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion Project: Tested By: 6/8/2016 Test Date: Area Served Model Number Serial Number Location **Unit Number** Manufacturer Exhaust Bathrooms MV-750-PSC-QD-115 13967587 Mechanical 109 ERV-1-EF GreenHeck Drive Data Motor / Fan Data Airflow Data Fan Sheave Direct Drive Actual Design Actual Design Direct Drive 6.2 Fan Bore 7.8 **Outlet Total** 500 505 Average Amps Direct Drive Average Volts 115 122 Motor Sheave 505 Unit Total 500 Direct Drive DD Motor Bore Motor RPM 1350 Return Belt Size Direct Drive Fan RPM DD OSA Direct Drive **Belt Quantity** Motor Manuf. NL Direct Drive 0.3 Center Distance Motor HP Turns Open** Direct Drive 1 Miscellaneous Data **Motor Mount** Inches In NL Motor Frame SP Setpoint (In.) Adjustment Inches Out Service Factor NLVFD Setting (HZ.) ** Applies to variable pitch sheaves Static Pressure Profile Data Traverse Data (Inside Dimensions) Exh. In Service Exh. In Width Height Ø Dia. 6.0 10.0 Area (ft 2) 0.20 0.55 265 822 Actual FPM Design FPM 250 818 S.P. (in.wc.) -.02 -.27

(in.wc.)		External Static		gn	Actual	To	inl	Desig		Actual
	-0.30	2	-	- 2	(Fait	-1.21	-	~	(#)	0.50
П	Α	В	С	D	E	F	G	Н	1	J
	KEIOI	NI AIN	A A	В	C E) E	F	G H	ì	J
-	PETU	AN AIR	T							
╛			K			0,1	ř	0,	0	H-
	MIX	ING BO	×	Wheel			0	1		SUPPLY AIR
- 1			'\	0	0	0		0	°	

5		Design	Actual
9 87	Total	45382	42109
oling	Sensible	6912	6436
Co			

	10.0	Tel .		Appara	tus Coi	l Data				Flow Co	ontrol De	vice Data		
	Service Entering				Water °F		Coil	Coil	Manufacturer	Manufacturer				
ner	Heat Wheel					Ent.	Lvg.	ΔΡ'	RH%	Туре	Size"	Position	ΔΡ	
Summ	Design	75.0	50.0	87.8	76.9	(E)	- 21	150	50.0	- 3	(A)		- 4	
S	Actual	71.8	48.9	83.6	74.6	(#)	ign.	- 1		12.		27		
	Service	Entering Air		Entering Air Leaving Air		Wat	Water °F		RH%	DUIN	Manufacturer			
ter	Heat Wheel	db °F	wb °F	db °F	wb °F	Ent.	Lvg.	ΔP'	RH%	Туре	Size"	. 5	ΔΡ	
Win	Design	68.0	35.0	29.6	25.2	1-	•			I P		-	140	
	Actual	1 350	-	100	2.	- 5	-	745	3		120		*	



	Air Distribution Test Report										
Project:					Main Admin	and Pavilion		TB#:	24887		
Test Date:		6/8/2016	Test	ed By:							
Unit No.	ERV-1	Service	Exhaust	Dwg No.	WM102	Design CFM	500	Actual CFM	505		

Area	Grille	Code/		Free	Desig	n Data	Initia	l Data	Fina	Data	Note
Served	Number	Туре	Size	Area	FPM	CFM	FPM	CFM	FPM	CFM	Note
124	1	EG	6"Ø	*	*	50	*	31	*	49	
123	2	EG	6"Ø		*	50	*	33	*	53	
103	3	EG	6"Ø		*	50	*	83	*	52	
105	4	EG	8"Ø	*	*	150	*	121	*	148	
107	5	EG	8"Ø	*	*	150	*	121	*	150	
110	6	EG	6"Ø	*	*	50	*	141	*	53	

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

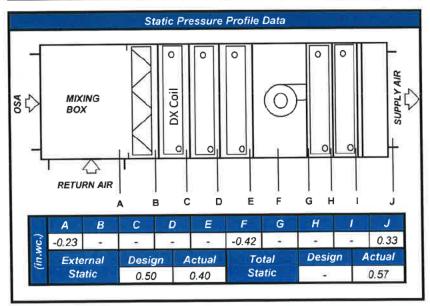
Test Date: ______ 3/8/2016 _____ Tested By: ______

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-1	ClimateMaster	TTV049	S14828806	Mechanical 131	Classroom 129

	Airfle	ow Data		
		Design	Actual	
	Outlet Total	1450	1500]
	Unit Total	1450	1515	J
FIM	Return	1300	1371	J
٥	OSA	150	145	I
				J

Miscellaneous Data							
SP Setpoint (In.)	· · · · · · · · · · · · · · · · · · ·						
VFD Setting (HZ.)	. * (

Motor	/Fan Data				
	Design	Actual			
Average Amps	6.9	2.6			
Average Volts	240 212				
Motor RPM	Med-High				
Fan RPM		Med-High			
Motor Manuf.	U.S.	Motor			
Motor HP	1	.0			
Phase		1			
Motor Frame	NL				
Service Factor	NL				



D.	Drive Data							
Fan Sheave	Direct Drive							
Fan Bore	Dire	ct Drive						
Motor Sheave	Direct Drive							
Motor Bore	Direct Drive							
Belt Size	Direct Drive							
Belt Quantity	Dire	ct Drive						
Center Distance	Dire	ct Drive						
Turns Open**	Dire	ct Drive						
Motor Mount	Inches In	*0						
Adjustment	Inches Out							

** Applies to variable pitch sheaves

Trave	rse Data (Ir	nside Dimen	sions)
Service	Sup 1-6	Return	OSA
Width		/(* ?	
Height	•	:#	
Ø Dia.	16.0	16.0	8.0
Area (ft²)	1.40	1.40	0.35
Actual FPM	1011	979	415
Design FPM	1036	929	429
S.P. (in.wc.)	. 29	21	405

יט		Design	Actual
g B	Total	37000	39132
iujo	Sensible	27000	26670
ပိ			

11	Apparatus Coil Data							Flow Control Device Data					
	Service	Enteri	ng Air	Leavi	ng Air	Wat	er °F	Coil	GPM -	Manufacturer		Flow Design	
ooling	DX			db °F	_	Ent.	Lvg.	∆P'		Туре	Size"	Position	ΔΡ
100	Design	78.0	65.0	60.8	56.8	-	-	Ti.	12.0	Auto Flow	Ē	50	2-32
ပ	Actual	65.8	57.9	49.5	48.2	70.2	76.3	15.7	12.0	Auto Flow	1.50	- 30	7.0

- 1) Speed section 3 with CFM Adjust on +5%
- 2) Unit total is sup 1-6 traverse with grille 7-8 added.



Air Distribution Test Report P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: Project: Tested By: _ 6/8/2016 Test Date: __ 1500 1450 Actual CFM WM102 Design CFM Dwg No. HP-1 Service Supply Unit No.

Area	Grille	Code/	1000	Free	Desig	n Data	Initia	Data	Final		Note
Served	Number	Туре	Size	Area	FPM	CFM	FPM	CFM	FPM	CFM	Note
129	1	SG	14x4	0.22	955	210	738	162	986	217	
129	2	SG	14x4	0.22	1091	240	800	176	1127	248	
129	3	SG	14x4	0.22	955	210	743	163	977	215	
129	4	SG	14x4	0.22	1091	240	943	207	1136	250	
129	5	SG	14x4	0.22	955	210	1023	225	995	219	
129	6	SG	14x4	0.22	1091	240	964	212	1141	251	
132	7	CD	6"Ø	*	*	50	*	131	*	48	
130	8	CD	6"Ø	*		50	*	124	*	52	_
							197				
	1										
	1										
			1								
				1							
	+										
			+	1	1						
		-	-	1	1	_					

Remarks:

* Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

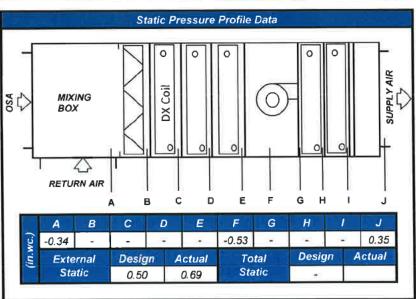
Test Date: _____ 6/7/2016 ____ Tested By: _____

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-2	ClimateMaster	TTV038	S14625322	Mechanical 109	Conference 120

	Airflow Data							
И.,		Design	Actual					
	Outlet Total	1020	1016					
	Unit Total	1020	1054					
FM	Return	665	701					
)	OSA	355	353					

Miscellaneous Data						
SP Setpoint (In.)	18:					
VFD Setting (HZ.)	(E)					

Motor / Fan Data					
	Design	Actual			
Average Amps	3.9	2.2			
Average Volts	240	209			
Motor RPM	NL	High			
Fan RPM	26	High			
Motor Manuf.	U.S.	Motor			
Motor HP	0	.5			
Phase		1			
Motor Frame	NL				
Service Factor	٨	IL			



Drive Data						
Fan Sheave	Dire	ct Drive				
Fan Bore	Dire	ct Drive				
Motor Sheave	Dire	ct Drive				
Motor Bore	Direct Drive					
Belt Size	Direct Drive					
Belt Quantity	Dire	ct Drive				
Center Distance	Dire	ct Drive				
Turns Open**	Direct Drive					
Motor Mount	Inches In					
Adjustment	Inches Out	:=:				

Traver	Traverse Data (Inside Dimensions)							
Service	Supply	Return	OSA					
Width			8.0					
Height	-		10.0					
Ø Dia.	14.0	14.0	727					
Area (ft²)	1.07	1.07	0.56					
Actual FPM	992	662	631					
Design FPM	953	621	634					

τU		Design	Actual
g BT	Total	40100	37862
ooling	Sensible	21400	23147
ပိ			

.34

-.05

35

S.P. (in.wc.)

1	Apparatus Coil Data							Flow Control Device Data					
	Service En	Entering Air		Leavi	Leaving Air		Water °F		GPM	Manufacturer		Flow Design	
ing		db °F				Ent.	Lvg.	ΔΡ'	GPW	Туре	Size"	Position	ΔP
100	Design	77.0	60.8	57.6	46.2		-	-	9.0	:#:	2	-	2-32
0	Actual	70.4	56.4	50.2	42.0	70.3	77.9	7.2	9.0	Auto Flow	1.50	9	6.3

Remarks:

1) Speed section 4 with CFM adjust on -5%



Project: ____ P1383 & P1384 - New Base Entry - Main Admin and Pavilion _____ TB#: ____24887

Test Date: ______ 6/7/2016 ____ Tested By: _____

Unit No.	HP-2	S	ervice	Supply	Dwg No.	WM102	Desig	n CFM	1020 A	ctual CFM	1016
Area Served	Grille Number	Code/ Type	Size	Free Area	Desigr FPM	CFM CFM	Initia FPM	l Data CFM	Fina FPM	l Data CFM	Note
121	1	CD	8"Ø	*	*	130	*	116	*	124	
121	2	CD	8"Ø	*	*	130	*	110	*	132	
120	3	CD	8"Ø	*	*	155	*	134	*	160	
120	4	CD	8"Ø	*	*	150	*	129	*	155	
103	5	CD	6"Ø	*	*	45	•	110	*	47	
104	6	CD	8"Ø	*	*	170	*	133	*	163	
105	7	CD	6"Ø	*	*	120	*	139	*	115	
107	8	CD	6"Ø	*	*	120	*	111	*	120	
										1	

HP-2	S	Service	Return	Dwg No.	WM102	Desig	n CFM	665	Actual CFM	685
Grille Number	Code/ Type	Size	Free Area	Desigr FPM	CFM CFM	Initia FPM	Data CFM	Fin FPM		Note
1	RG	8″Ø	*	*	215	*	137	*	219	
2	RG	8"Ø	*	3#6	250	*	264	*	262	
3	RG	8x6	*	*	200	*	260	*	204	
									+	
	Grille Number 1	Grille Code/ Number Type 1 RG 2 RG	Grille Code/ Type Size 1 RG 8"Ø 2 RG 8"Ø	Grille Number Code/ Type Size Free Area 1 RG 8"Ø * 2 RG 8"Ø *	Grille Number Code/ Type Size Free Area Design FPM 1 RG 8"Ø * * 2 RG 8"Ø * *	Grille Number Code/ Type Size Free Area Design CFM FPM CFM 1 RG 8"Ø * * 215 2 RG 8"Ø * * 250	Grille Number Code/ Type Size Free Area Design CFM Initial FPM 1 RG 8"Ø * 215 * 2 RG 8"Ø * 250 *	Grille Number Code/ Type Size Free Area Design CFM Initial Data 1 RG 8"Ø * * 215 * 137 2 RG 8"Ø * * 250 * 264	Grille Number Code/ Type Size Free Area Design CFM Initial Data Fin 1 RG 8"Ø * * 215 * 137 * 2 RG 8"Ø * * 250 * 264 *	Grille Number Code/ Type Size Free Area Design CFM Initial Data Final Data 1 RG 8"Ø * * 215 * 137 * 219 2 RG 8"Ø * * 250 * 264 * 262

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: ______ 6/8/2016 ____ Tested By: ______

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-3	ClimateMaster	TTV049	S14828804	Mechanical 109	Office 114

	Airflow Data								
		Design	Actual						
	Outlet Total	1700	1700						
	Unit Total	1700	1765						
SFIN	Return	1480	1540						
٥	OSA	220	225						

Miscellaneous Data					
SP Setpoint (In.)	y s i				
VFD Setting (HZ.)	(*				

Motor / Fan Data						
	Design	Actual				
Average Amps	6.9	3.4				
Average Volts	240	207				
Motor RPM	NL High					
Fan RPM	37	High				
Motor Manuf.	U.S.	Motor				
Motor HP	1	.0				
Phase	1					
Motor Frame	NL					
Service Factor		<i>IL</i>				

D	Drive Data							
Fan Sheave	Direct Drive							
Fan Bore	Dire	ct Drive						
Motor Sheave	Dire	ct Drive						
Motor Bore	Direct Drive							
Belt Size	Direct Drive							
Belt Quantity	Direct Drive							
Center Distance	Dire	ect Drive						
Turns Open**	Dire	act Drive						
Motor Mount	Inches In	200						
Adjustment	Inches Out	:*:						

** Applies to variable pitch sheaves

Traver	Traverse Data (Inside Dimensions)							
Service	Supply	Return	OSA					
Width			8.0					
Height	220	25	8.0					
Ø Dia.	18.0	18.0	1.0					
Area (ft²)	1.77	1.77	0.44					
Actual FPM	997	870	512					
Design FPM	960	836	500					
S.P. (in.wc.)	.35	16	- 13					

U.		Design	Actual
g BTU	Total	47500	45511
ooling	Sensible	39200	37552
Co			

			St	atic Pr	essure	Profile	Data			
osa \	MIXI BOX RETUI	C RN AIR		o DX Coil o	0	0	() 	G H	0	SUPPLYAIR
	A	В	C	D	E	F	G	Н	1	J
(:)	-0.22	i (#)		*	*	-0.91	1	4.5	÷	0.35
(in.wc.)	Exte	rnal	Desig	ın A	ctual	То	tal	Desig	ın A	Actual
	Sta	tic	0.50		0.57	Sta	tic	- 2		1.26

1	Apparatus Coil Data						Flow C	ontrol De	vice Data				
	Service	Enteri	Entering Air		-	Water °F		Water ºE Coil		Manufacturer		Flow Design	
ing			wb °F			Ent.	Lvg.	ΔΡ'	ΔP' GPM	Туре	Size"	Position	ΔP
100	Design	77.0	59.7	55.6	49.5	*		-	12.0		2		2-32
ပ	Actual	69.5	52.4	49.8	41.5	70.3	77.1	11.5	12.0	Auto Flow	1.50		4.0

Remarks:

1) Speed tap setting 4, with CFM adjust at +5%



Air Distribution Test Report

 Project:
 P1383 & P1384 - New Base Entry - Main Admin and Pavilion
 TB#:
 24887

 Test Date:
 6/7/2016
 Tested By:
 (5)(6)

Unit No.	HP-3	S	ervice	Supply	Dwg No.	WM102	Desig	n CFM	1700	Actual CFM	1700
Area Served	Grille Number	Code/ Type	Size	Free Area	Desigr FPM	CFM CFM	Initia FPM	l Data CFM	Fii FPM	nal Data CFM	Note
125	1	SG	10X3	0.11	1091	120	864	95	1055	116	
119	2	SG	12X4	0.18	1028	185	906	163	1072	193	
118	3	SG	12X4	0.18	1028	185	1078	194	1050	189	
117	4	SG	12X4	0.18	1028	185	817	147	1000	180	
116	5	SG	12X4	0.18	1028	185	956	172	1028	185	
113	6	SG	12X3	0.14	893	125	807	113	900	126	
113	7	SG	12X3	0.14	893	125	786	110	879	123	
114	8	SG	12X3	0.14	1000	140	1100	154	993	139	
114	9	SG	12X3	0.14	1000	140	964	135	1014	142	
115	10	SG	12X4	0.18	1028	185	1061	191	1006	181	
125	11	SG	10X3	0.11	1136	125	1418	156	1145	126	

Unit No.	HP-3	S Se	ervice	Return	Dwg No.	WM102	Design	r CFM	1480	Actual CFM	1484
Area Served	Grille Number	Code/ Type	Size	Free Area	Desigr FPM	CFM CFM	Initial FPM	Data CFM	Fi. FPM	nal Data CFM	Note
119	1	RG	8X6	0.26	654	170	535	139	665	173	
118	2	RG	8X6	0.26	654	170	542	141	638	166	
117	3	RG	8X6	0.26	654	170	604	157	662	172	
116	4	RG	8X6	0,26	654	170	708	184	650	169	
115	5	RG	8X6	0.26	654	170	588	153	673	175	
114	6	RG	10X6	0.34	765	260	874	297	794	270	
125	7	RG	12X8	0.57	649	370	719	410	630	359	

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: ______ 6/7/2016 Tested By: ______

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
HP-4	ClimateMaster	TTV038	S14625321	Mechanical 109	Waiting 101

	Airflow Data							
	Design Actual							
	Outlet Total	1200	1169					
	Unit Total	1200	1186					
FIN	Return	1055	1037					
٥	OSA	145	148					

Miscellaneous Data				
SP Setpoint (In.)				
VFD Setting (HZ.)				

Motor / Fan Data						
	Design Actua					
Average Amps	3.9	0.9				
Average Volts	240	212				
Motor RPM	NL Med					
Fan RPM	- Med					
Motor Manuf.	U.S.	Motor				
Motor HP	0	.5				
Phase		1				
Motor Frame	NL					
Service Factor	٨	IL				

- [D	rive Data				
- 1	Fan Sheave	Dire	ct Drive			
-	Fan Bore Direct Drive					
-	Motor Sheave	Direct Drive				
(1)	Motor Bore	Direct Drive				
	Belt Size	Direct Drive				
	Belt Quantity	Direct Drive Direct Drive Direct Drive				
	Center Distance					
	Turns Open**					
	Motor Mount	Inches In) iei			
	Adjustment	Inches Out				

** Applies to variable pitch sheaves

Traverse Data (Inside Dimensions)									
Service	Supply	Return	OSA						
Width	0 : €:		8.0						
Height	NZ:	- 4	8.0						
Ø Dia.	16.0	16.0	, ē						
Area (ft²)	1.40	1.40	0.44						
Actual FPM	847	741	336						
Design FPM	857	754	330						
S.P. (in.wc.)	.24	13	0						

вти		Design	Actual
	Total	37000	33623
Sooling	Sensible	26900	25618
Co			

			Sta	atic Pr	essure	Profile	Data			
ossa –	MIXI BOX RETUR	RN AIR		O DX Coil O	O O	O	() 	O O	0	SUPPLYAIR T
	A	В	С	D	E	F	G	Н	I.	J
(C.)	-0.16	•	ı,	-		-0.35		7	•	0.24
(in.wc.)	Exte	rnal	Desig	n A	ctual	To	tal	Desig	gn .	Actual
9	Sta	tic	0.50		0.40	Sta	tic	8		0.59

	Apparatus Coil Data						Flow C	ontrol De	vice Data	111					
			Entering Air Leaving Air		Leaving Air Water %		er °F Coil				Coil GPM	Manufacturer		Flow Design	
ing		db °F	_				Lvg.	ΔP'	GPW	Туре	Size"	Position	ΔΡ		
100	Design	76.0	58.9	55.2	47.3	:+::	3#3	196	9.0	<u> </u>			2-32		
0	Actual	70.9	52.4	50.9	40.3	70.2	78.1	11.7	9.0	Auto Flow	1.50		5.2		

Remarks:

1) Speed section 3



Air Distribution Test Report 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: ___ Project: 6/7/2016 Test Date: Tested By: __ Actual CFM 1169 Dwg No. WM102 Design CFM 1200 Unit No. HP-4 Service Supply Design CFM Initial Data Final Data Free Area Grille Code/ Note Size **CFM** CFM **FPM FPM** Served Number Туре Area 889 98 10x3 0.11 909 100 685 75 SG 100 1 134 1113 245 250 610 0.22 1136 101 2 SG 14x4 660 145 1084 238 1136 250 0.22 14x4 101 3 SG 43 45 6"Ø CD124 4 43 6"Ø 45 68 5 CD123 115 109 481 455 0.24 500 120 101 6 SG 10x6 130 490 118 120 540 0.24 500 101 7 SG 10x6 * 97 * 100 71 CD 6"Ø 8 102 103 6"Ø 100 120 102 9 CD 124 69 70 127 10 CD6"Ø

Unit No.	HP-4		Service	Return	Dwg No.	WM102	Desig	n CFM	1055 A	ctual CFM	1011
Area Served	Grille Number	Code/ Type	Size	Free Area	Desigi FPM	CFM CFM	Initia FPM	l Data CFM	Fina FPM	l Data CFM	Note
101	1	RG	18x10	*	*	630	%	673	*	605	
127	2	RG	10"Ø	*	*	370	140	67	*	353	
127	3	RG	6"Ø	*	*	55	*	175	*	53	
				-							

Remarks: * Flow Hood Measurements



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

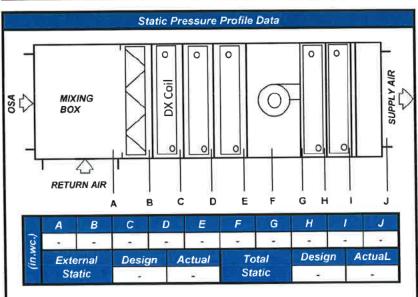
Test Date: 3/8/2016 Tested By: _____

Unit Number	Manufacturer	Model Number	Serial Number	Location	Area Served
MDSS-1	LG	LSN180HSV4	412KAGSQW007	Wall	NMCI / Comm 111

Airflow Data								
		Design	Actual					
	Outlet Total		3.83					
	Unit Total	600	584					
FIN	Return	600	584					
٥	OSA							

Miscellaneous Data						
SP Setpoint (In.)						
VFD Setting (HZ.)						

Motor / Fan Data							
	Design	Actual					
Average Amps	0.4	0.4					
Average Volts	208	208					
Motor RPM	ID	High					
Fan RPM	3.0%	High					
Motor Manuf.	1.	D					
Motor HP		D					
Phase	1						
Motor Frame	ID						
Service Factor	/	D					



Drive Data						
Fan Sheave	Dire	ct Drive				
Fan Bore	Dire	ct Drive				
Motor Sheave	Direct Drive					
Motor Bore	Direct Drive					
Belt Size	Direct Drive					
Belt Quantity	Direct Drive					
Center Distance	Direct Drive					
Turns Open**	Direct Drive					
Motor Mount	Inches In	.es				
Adjustment	Inches Out	-				

вти		Design	Actual
	Total	18000	19053
ooling	Sensible	51015	15642
ပိ			

	Apparatus Coil Data							Flow Control Device Data					
	Service	PROPERTY AND DESCRIPTION OF THE PERSON OF TH		Coil	GPM	Manufacturer							
ing		db °F				Ent.	Lvg.	ΔΡ'	D' GPW	Туре	Size"	Position	ΔΡ
100	Design	80.0	63.0		52.8	-			9.	-	ĕ	(2)	2
٥	Actual	68.3	55.4	43.5	42.1	-	*	-	296	19%	-	(#)	-



Air Handling Unit Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

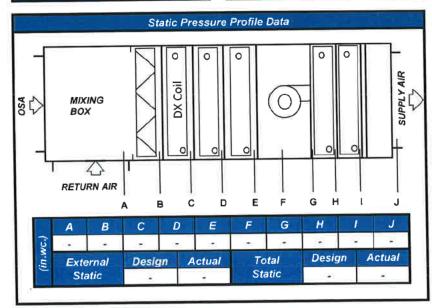
Test Date: ______ 3/8/2016 ____ Tested By: ______

Unit Number Manufacturer		Model Number	Serial Number	Location	Area Served	
MDSS-2	LG	LSN180HSV4	412KACOW003	Wall	Station 206	

	Airfle	ow Data	
		Design	Actual
	Outlet Total	+	:#1
	Unit Total	500	485
FIM	Return	500	485
٦	OSA	*	2.55

Miscellaneous Data				
SP Setpoint (In.)	<u>*</u>			
VFD Setting (HZ.)				

Motor / Fan Data						
	Design	Actual				
Average Amps	0.4	0.4				
Average Volts	208	209				
Motor RPM	ID	Med				
Fan RPM		Med				
Motor Manuf.	ID					
Motor HP		D				
Phase		1				
Motor Frame		ID				
Service Factor		'D				



Drive Data					
Fan Sheave	Dire	ct Drive			
Fan Bore	Dire	ct Drive			
Motor Sheave Direct Drive					
Motor Bore	Direct Drive				
Belt Size	Direct Drive				
Belt Quantity	Dire	ct Drive			
Center Distance	Dire	ct Drive			
Turns Open**	Dire	ct Drive			
Motor Mount	Inches In				
Adjustment	Inches Out	(#)			
** Applies to	variable pitch	sheaves			

Traverse Data (Inside Dimensions)

Service Supply
Width 30.0
Height 3.0
Ø Dia.

Area (ft²) 0.63
Actual FPM 771
Design FPM 794
S.P. (in.wc.)

U.		Design	Actual
J B1	Total	19500	19490
oling	Sensible	7222	15138
CO			

	45-T-1-1-X	- 10	Ap	parati	ıs Coil	Data	7 1	7 100		Flow C	ontrol De	vice Data			
	Service			Entering Air Leavin						Coil	GPM	Manufacturer			
ooling		db °F					Lvg.	ΔP'	GPW	Туре	Size"	Position	ΔΡ		
loo	Design	80.0	63.0	ж	49.2		- 7	-	÷		-	-	- 1		
0	Actual	70.4	56.8	41.5	40.4	9_	-	-	*		-	٠	3		



Fan Test Report

Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 3/8/2016 Tested By: _______(D)(0)

rest Date:	3/2010		- T
Unit Dat	Notes		
Fan Number	EF		
Service	Female		
Manufacturer	Pana	sonic	
Model Number	FV-05-1	11VKS1	
Airflow Data	Design	Actual	Notes
CFM (Unit Total)	50	52	
CFM (Connected Load)	5		
Pressure Data	Design	Actual	Notes
Total SP (in.wc.)	0.25		(1)
Suction (in.wc.)		954	
Discharge (in.wc.)	-	724	
Motor / Fan Data	Rated	Actual	Notes
Voltage	120	119	
Amps	0.3	0.1	
Motor RPM	NL	DD	
Fan RPM	is:	DD	
Motor Manufacturer	ID		
Motor HP		D	
Phase		1	
Service Factor		ID	
VFD Setting (HZ.)	l	ID	
Drive Da	ata		Notes
Fan Sheave Size	Direc	t Drive	
Fan Bore Size	Direc		
Motor Sheave Size	Direc		
Motor Bore Size	Direc		
Belt Size	Direc	ct Drive	
Number Of Belts	Direc	ct Drive	
Center Distance	Dire	ct Drive	

(b)(d)	_		
Unit Dat	a		Notes
Fan Number	EF		
Service	Male	Toilet	
Manufacturer	Pana	sonic	
Model Number	FV-05-	11VKS1	
Airflow Data	Design	Actual	Notes
CFM (Unit Total)	50	51	
CFM (Connected Load)	-		
Pressure Data	Design	Actual	Notes
Total SP (in.wc.)	0.25	(4)	(1)
Suction (in.wc.)	-	740	
Discharge (in.wc.)	*	(#)i	
Motor / Fan Data	Rated	Actual	Notes
Voltage	120	119	
Amps	0.3	0.1	
Motor RPM	NL	DD	
Fan RPM	8,	DD	
Motor Manufacturer		ID	
Motor HP		ID	
Phase		1	
Service Factor		ID	
VFD Setting (HZ.)	<u> </u>	ID	
Drive Da	ata	- 5 .	Notes
Fan Sheave Size	Direc	ct Drive	
Fan Bore Size	Direc		
Motor Sheave Size	Dire		
Motor Bore Size	Dire	ļ	
Belt Size	Dire	ct Drive	1
Number Of Belts		ct Drive	-
Center Distance	Dire	ct Drive	

Remarks:

1) Static too low to read.



Fan Test Report

Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion	TB#: _	24887
	(b)(6)		

Test Date: _______3/9/2016 _____ Tested By: ______(b)(6)

Test Date: 3/9/2016 Tested By					
Unit Dat	Notes				
Fan Number	EF				
Service	Vehic				
Manufacturer	Gren	Heck			
Model Number	SEI-12-	432-E-X			
Airflow Data	Design	Design Actual			
CFM (Unit Total)	300	311			
CFM (Connected Load)	1/25	-			
Pressure Data	Design	Actual	Notes		
Total SP (in.wc.)	0.25	π			
Suction (in.wc.)	(E	-			
Discharge (in.wc.)	<u></u>	-			
Motor / Fan Data	Rated	Actual	Notes		
Voltage	115	119			
Amps	1.6	1.3			
Motor RPM	1550	DD			
Fan RPM	-	DD			
Motor Manufacturer	McI	Millan			
Motor HP	0.	.13			
Phase		1			
Service Factor		VL			
VFD Setting (HZ.)					
Drive D	ata		Notes		
Fan Sheave Size	Direc	t Drive			
Fan Bore Size	Direc				
Motor Sheave Size	Direc				
Motor Bore Size	Direc				
Belt Size	Direc	ct Drive			
Number Of Belts	Direc	ct Drive	1		
Center Distance	Direc	ct Drive			

(5)(5			
Unit Dat	a	1, 31	Notes
Fan Number Service Manufacturer Model Number			
Airflow Data	Design	Actual	Notes
CFM (Unit Total) CFM (Connected Load)			
Pressure Data	Design	Actual	Notes
Total SP (in.wc.)			
Suction (in.wc.)	(4)		
Discharge (in.wc.)			
Motor / Fan Data	Rated	Actual	Notes
Voltage			
Amps			
Motor RPM			
Fan RPM			
Motor Manufacturer			
Motor HP			
Phase			
Service Factor			
VFD Setting (HZ.)	<u></u>		
Drive D	ata		Notes
Fan Sheave Size			
Fan Bore Size			
Motor Sheave Size			
Motor Bore Size			
Belt Size			
Number Of Belts			
Center Distance			



		Traverse	Test Report		
Project:	P1383 &	P1384 - New Base En	try - Main Admin and Pavilion	TB#:_	24887
Test Date:	3/9/2016	Tested By:	(b)(6)	=7/ ==	

rest Date.		72010		-							
Unit Number	Service		mensions	Inch Ø	Area (sq.ft.)	FF			=M	S.P.	Notes
Unit Number	Service	Width (in.)	Height (in.)	Dia.	Area (Sq.II.)	Design	Actual	Design	Actual	(in.wc.)	Hotes
EF-3	Exhaust	12.4	11.5		0.99	303	314	300	311		
OSA											
HP-2	OSA	8.0	10.0	-	0.56	634	631	355	353	0.05	
HP-3	OSA	8.0	8.0	-	0.44	500	512	220	225	-0.13	
HP-4	OSA	8.0	8.0		0.44	330	336	145	148		
		- 3								-	
										-	
								-			
								<u> </u>	ļ	-	
						_	ļ	-	ļ		
								-			
							ļ	<u> </u>		-	
						<u> </u>		₩	1	-	



Electric Heater Test Report

 Project:
 P1383 & P1384 - New Base Entry - Main Admin and Pavilion
 TB#:
 24887

 Test Date:
 3/8/16 - 3/22/16
 Tested By:
 (b)(6)

Unit				1	Vo	lts		411	An	nps		CFM	Air	Temp.	(°F)	Notes
Number		KW	Ø	L1-L2	L1-L3	L2-L3	Avg.	L1	L2	L3	Avg.	G/ III	Ent.	Lvg.	ΔΤ	
	Design	2.0	1	208		:e	208	9.6	*	-	9.6		-			
UH-A	Actual	1.9	1	213	<u></u>		213	8.7		_ =	8.7	536	75.4	86.6	11.2	(1)
	Design	2.0	1	208	745	- 4	208	9.6		1300	9.6	72/	*	-		
UH-B	Actual	1.9	1	213		+	213	8.8	===	•	8.8	613	79.1	88.9	9.8	(1)
	Design	2.0	1	208	772	2	208	9.6		275	9.6	(-8)		12		
UH-C	Actual	1.8	1	209	=	4	209	8.6	100	es.	8.6	470	64.9	77.0	12.1	(1)
	Design	2.0	1	208	- 5	-	208	9.6			9.6		100			-
UH-D	Actual	1.8	1	208	-	-2	209	8.7	-		8.7	409	59.2	73.1	13.9	(1)
	Design												-	-		-
	Actual												<u> </u>			╄
	Design												-			├
i i	Actual															-
	Design												-	-	_	-
	Actual							<u> </u>				<u> </u>	<u> </u>	-	_	-
	Design										_		-	-		-
	Actual											<u> </u>	+-	-	<u> </u>	╄
	Design									_			100			-
	Actual							_		_		<u> </u>	-	-		+-
	Design											ļ		:-:	-	+
	Actual							<u> </u>	_	_		!	+	+	-	+-
	Design							_		1			-	-		+-
	Actual							<u> </u>			4	_	-	-	1-	+
	Design						_	_				1	<u> </u>	+-	-	+
	Actual	1								_		-	+	1		+
	Design	8									1	-		è		+-
	Actual															

Remarks:

1) CFM Calculated from Delta T



Pump Test Report Project: P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887 Test Date: 5/27/2016 & 7/1/16 Tested By: (b)(6)

Test	Date: 5/27/201	6 & 7/1/16	re	sted by:		
		-11		Notes		
	Pump Number	P-	1		16.55	Pump Number
ata	Service	Geothe	ermal		Jata	Service
Pump Data	Pump Manuf.	Bell & G	Gossett		Pump Data	Pump Manuf.
mn	Model Number	90 1.25AA	4.375 BF		un _d	Model Number
	Serial Number	C196636				Serial Number
	Impeller Size (In.)	4.3	75			Impeller Size (In
e		GP	M	Notes	. To	Walted Jan
Water Data	Design	46.	.0		Water Data	Design
ter	Final	48	.0		iter	Final
Wa	Wide Open	52	.0		Wa	Wide Open
N. 1		Psi.	Ft.	Notes		
	Wide Open ΔP	22.8	52.7			Wide Open ∆F
	No Flow Discharge	56.2				No Flow Dischar
ţa.	No Flow Suction	25.1	18		ta ta	No Flow Suction
Pressure Data	No Flow Head ΔP	31.1	71.8		Pressure Data	No Flow Head A
ure	Final Discharge	63.1			ure	Final Discharg
888	Final Suction	39.8			ess	Final Suction
P	Final Head ΔP	23.3	53.8		P	Final Head ΔF
11-	Design Head ΔP	3	54.0			Design Head A
	Pump Off (Psi)	25	5.1			Pump Off (Psi
	ΔP Setpoint (Psi)		5			ΔP Setpoint (P:
		Rated	Actual	Notes		
	Motor RPM	3450	DD			Motor RPM
ata	Volts	208	214		ata	Volts
I Dë	Amps	9.1	6.8		I D	Amps
rica	Corrected FLA	8	8.8		trice	Corrected FL
ect	Motor HP	1	.5		lect	Motor HP
Motor / Electrical Data	Phase		1		Motor / Electrical Data	Phase
tor	Motor Manuf.	Mar	athon		otor	Motor Manuf
Mo	Service Factor	1.	30		Mc	Service Facto
2 100	Calculated BHP	1	1.2			Calculated BH
	VFD Setting (HZ.)		-			VFD Setting (H

		-	-	Notes
	Dump Number	P-	2	Notes
ta	Pump Number			
Pump Data	Service	HPWH-		
ш	Pump Manuf.	Bell & G		
Pu	Model Number	PL-3		
	Serial Number Impeller Size (In.)	1BLO	J3LF	
	Impelier Size (III.)			
ta		GP	M	Notes
. Da	Design	5.	0	
Water Data	Final	5.	0	(1)
Š	Wide Open	9.	0	
		Psi.	Ft.	Notes
	Wide Open ΔP	13.2	30.5	
	No Flow Discharge	70.2	325	
e e	No Flow Suction	54.9		
Dai	No Flow Head ΔP	15.3	35.3	
Pressure Data	Final Discharge	66.4	<u>@</u>	
SS	Final Suction	53.2		
Pre	Final Head ΔP	13.2	30.5	
	Design Head ΔP	8	4.0	
	Pump Off (Psi)	30	0.3	
	ΔP Setpoint (Psi)		•	
		Rated	Actual	Notes
	Motor RPM	3300	DD	
ţ2	Volts	-115	121	
I Da	Amps	2.1	1,7	
Motor / Electrical Data	Corrected FLA	2	.0	
ecti	Motor HP		.2	
/ El	Phase		1	
tor	Motor Manuf.	Bell &	Gossett	
Mo	Service Factor		VL	
	Calculated BHP		0.1	
	VFD Setting (HZ.)		-	

Remarks:

1) Actual system pressure is over pump capacity.



Pump Test Report 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: Project: ____ 7/1/2016 Tested By: Test Date: ____ Notes Notes Pump Number **Pump Number** (1) P-3 Pump Data Pump Data Service Recirculating Service Pump Manuf. Pump Manuf. Bell & Gossett Model Number Model Number NBF-22 Serial Number 103252LF Serial Number Impeller Size (In.) Impeller Size (In.) **GPM** Notes Notes **GPM** Data Water Data Design (1) NL Design Water Final 0.0 Final Wide Open 0.0 Wide Open Notes Psi. Ft. Ft. Notes Psi. Wide Open ∆P 15.2 Wide Open ∆P 6.6 No Flow Discharge No Flow Discharge 57.6 **No Flow Suction No Flow Suction** 51.0 . Pressure Data Pressure Data No Flow Head ΔP No Flow Head ΔP 6.6 15.2 Final Discharge Final Discharge 57.6 **Final Suction** . **Final Suction** 51.0 Final Head AP Final Head ΔP 6.6 15.2 Design Head AP NL Design Head AP 59.9 Pump Off (Psi) Pump Off (Psi) ΔP Setpoint (Psi) ΔP Setpoint (Psi) Rated Actual Notes Rated Actual Notes Motor RPM **Motor RPM** 2940 Motor / Electrical Data Volts Electrical Data Volts 115 119 0.5 **Amps** 0.8 **Amps** Corrected FLA Corrected FLA Motor HP Motor HP 0.12 Phase Phase 1 Motor/ Motor Manuf. Bell & Gossett Motor Manuf. Service Factor Service Factor NL Calculated BHP Calculated BHP VFD Setting (HZ.) VFD Setting (HZ.)

¹⁾ P-3 was not able to deliver design GPM at the time of testing



Apparatus Heating Coil Test Report

Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion	_TB#:	24887
	(b)(6)		

			(b)(6)
Test Date:	6/8/2016	Tested By:	(6)(0)

t Date:	6/8/2016		Tested
Unit	Data		Note
Unit Number	HPV	/H-1	
Service	Lo	ad	
	Air Data	No.	
	Design	Actual	Note
CFM	130	90	
Entering DB (°F)		3	
Entering WB (°F)		.50	
Leaving DB (°F)	-	(2)	
Leaving WB (°F)	-		
	Motor Date		
	Water Data Design	Actual	Note
GPM	5.0	5.0	
Entering Wtr.(°F)	115.0	120.0	
Leaving Wtr.(°F)	125.0	130.2	
Coil AP (ft.wc.)		13.0	
Flow Contr	ol Device Da	ata	Note
Manufacturer			
Туре			
Size (in.)			
Position	Ħ		
ΔP ()	-	2	

Service	Geoth	nermal	
	Air Data	12	
	Design	Actual	Note
CFM		-	
Entering DB (°F)		-	
Entering WB (°F)	1941		
Leaving DB (°F)	14	-	
Leaving WB (°F)	- 12	(4)	
	, ,		
	Water Date	a 101 ii =	1 1
	Design	Actual	Note
GPM	4.0	4.0	
Entering Wtr.(°F	70.0	70.1	
Leaving Wtr.(°F) =	73.2	
Coil AP (ft.wc.	3.0	3.5	
	A		
Flow Con	trol Device D	ata	Note
Manufacturer	TAC	00	
Туре	ACCUFLO-	VENTORI	
Size (in.)	1.0	00	
Position	45	.0	<u> </u>
ΔP ()	9.	6	

Unit Data

HPWH-1

Unit Number

Note



Apparatus Heating Coil Test Report P1383 & P1384 - New Base Entry - Main Admin and Pavilion **TB#:** 24887 Project: Tested By: Test Date: 12/01/16 - 2/28/17 Unit Data Note Unit Data Note HP-1 **Unit Number** HP-2 (1) (1) **Unit Number** Service Service Air Data Air Data Note Design Actual Design Actual 1061 CFM 1020 CFM 1450 1515 Entering DB (°F) Entering DB (°F) Entering WB (°F) Entering WB (°F) Leaving DB (°F) Leaving DB (°F) Leaving WB (°F) Leaving WB (°F) Water Data Water Data Design Actual Note Note Design Actual **GPM** 9.0 9.0 **GPM** 12.0 12.0 Entering Wtr.(°F) Entering Wtr.(°F) Leaving Wtr.(°F) Leaving Wtr.(°F) Coil AP (ft.wc.) Coil AP (ft.wc.) Flow Control Device Data Note Flow Control Device Data Note Flow Design Flow Design Manufacturer Manufacturer Auto Flow Auto Flow Type Type 1.50 Size (in.) 1.50 Size (in.)

Position

ΔP (

6.3

Remarks:

Position

ΔP (

1) Season of Maximum Load Heating

7.0



Apparatus Heating Coil Test Report

P1383 & P1384 - New Base Entry - Main Admin and Pavilion TB#: 24887

Test Date: 12	/01/16 - 2/28	/17	Tested B
Unit	Data	5.50 T	Note
Unit Number	HF	2-3	(1)
Service			
	Air Data		
	Design	Actual	Note
CFM	1700	1765	
Entering DB (°F)			
Entering WB (°F)			-
Leaving DB (°F)			
Leaving WB (°F)			
	Water Data		
	Design	Actual	Note
GPM	12.0	12.0	
Entering Wtr.(°F)			
Leaving Wtr.(°F)			
Coil AP (ft.wc.)			
		L	<u> </u>
Flow Contro	ol Device Da	ata	Note
Manufacturer	Flow D	esign	
Туре	Auto F	low	
Size (in.)	1.5	0	
Position	<u>s</u>		
ΔP ()	4.0)	-
7 15 L			

Ur	it Data	g je k		Note		
Unit Number		HP	-4	(1)		
Service						
	Air	Data				
11.00	Design Actual					
CFM	1	200	1186			
Entering DB (°F)						
Entering WB (°F)						
Leaving DB (°F)						
Leaving WB (°F)	4					
	Wat	er Data	19.F.Y.Y			
	-11	esign	Actual	Note		
GPM		9.0	9.0			
Entering Wtr.(°F)					
Leaving Wtr.(°F						
Coil AP (ft.wc.)						
Flow Con	trol De	vice Da	ita	Note		
Manufacturer		Flow De	esign			
Туре		Auto F				
Size (in.)		1.50				
Position						
		4.0				
ΔP ()		4.0				

Remarks:

1) Season of Maximum Load Heating



Curves & Charts

TB#: 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion Project:

EF 1 4 EF 2

WhisperGreenSelect

Specification Submittal Data / Panasonic Ventilation Fan

Customizable Veritation Fanulight shall be low sone ceiling mount rated for continuous run. Fan shall the ENERGY STARP rated and certified by this Homo Veritating Institute (FVII). Fan shall include energy efficient LED agriding. Evaluated by Lincouverters Luboratories and conform to both UL and cUL salory standards.

Motor/Blower:

- Section/wsewers

 Ericlosed Do Bushhkess motor, teichnology rated for confirmation run.

 Fan veritiellon refus shall be manually adji statule for 50-80-110 CFM.

 Power rating shall be 120 voits and 60 hz.

 Fan shall be UL lated for hubbahnwar andosure when used with a GFCI protected nirout; and Fan artist to Calling (TYPE LC):
 Fan equipped with thermal cutoff kise.
 Removable, permanently kithricated, plug-in moter.

- Housing:

 Rust proof paint, gairanized stock body.

 Rust proof paint, gairanized stock body.

 Integrated dusi 4* or 6* "damate for damate stock.

 Buttern metal fange provides blooking for penetrations through drywalf as an Air Barrier, and
 assats with the decreases in legicoge in the Buldding Envelope during blower door testing.

 Buttern beackdast dompor.

 Articulating and expandable installation bracket up to 24*.

Griffia:

- Attractive design using Poly Pro material,
 Attractives directly to housing with torsion springs.
 Attractives a motion sensor cap for use as a cover when the motion sensor Plug in Play**
 module has not been selected. (2) /W/GU24 basa LEO lamps evoluded

Two replaceable, ENERGY STAR® rated, 7W GU24 base LED lamps

Warranty:

ALL Parts: 3 Years from original purchase date.
 DC Motor: 6 Years from original purchase date.
 LED: 5 years from ong-nal purchase date.



Architectural Specifications:

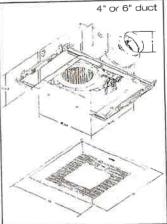
Customizable Ventilation Familiph shall be ceiling mount, ENERGY STAPF rated type with multi-speed central (0, 30-100 CFM, in 10 CFM increments) that shall be built-in with a highdray adjustable delay intern and activation by a will switch, Motion Sensor Plug '19 Flay '19 mounts' or Condensation Sensor at .35 way. Power Consumption shall be no greater than 4,05,071.1 treate at 0.35 way. Power Consumption shall be no greater than 4,05,071.1 treate at 0.35 way. Power Consumption Sensor
DC Motor Technology:



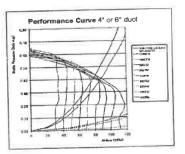
When fan zenses static pressure, its speed is suiternatically increased to ensure that the deshed GFM is not compromised, which allows the fan to parform as rated.

Model	Quantity	Comments	Project:		
Model			Location:		
			Architect.		
			Engineer:		
			Contractor:		
			Submitted by:		
			Date:		

FV-05-11VKSL1



FV-05-11VKSL1



oc		



Curves & Charts

Project:

P1383 & P1384 - New Base Entry - Main Admin and Pavilion

TB#:

#: 2488

モデ 3 Vari-Green® Motor Options



Benefits

Operates on AC power that's converted to DC providing a more efficient motor operation as compared to an AC operation.

- The motor can attain up to 85% efficiency and reduce energy consumption.
- Watt savings of 30-70% depending on rpm.
 Note: As motor speed is turned down, efficiency stays high as compared to an AC motor that decreases dramatically.
- Operates cooler than a standard AC motor at lower RPMs. A cooler motor has longer motor life and reduces energy consumption.
- 80% usable RPM turndown as low as 300 rpm.
- SEI fans with Vari-Green motors can provide all the CFM and static pressure ranges of a comparable belt drive.

- Maintenance costs are reduced as there are no belts or bearings to replace and no pulleys to adjust.
- Direct drive fans are often preferred where maintenance access is difficult.
- Provides a solution for demand controlled ventilation applications.

Vari-Green Advantages

- Initial cost is less than a belt drive/motor starter combination.
- Lower operating cost
- No maintenance, no belts, pulleys or bearings
- Easy RPM adjustment

Park man	The state of	er that in the part of the	Max	Max	HERSON	10,79690	37000	. 0	FM/Stat	a Press	ure in In	ches W	G	B.Ferica.		35576
Model	Number	Fan RPM	BHP	Sones	0.00	0.05	0.10	0.125	0.15	0.20	0.25	0.30	0.375	0.50	0.625	0.75
MEGHAC-STR	POSESSON ILLEY	1725			511	476	435	387	349	261	220	191				
SE	1-8-440	300	0,044	11.3	89										_	_
		1725		44.0	1029	979	921	889	856	792	707		-		-	
SE1	-10-440	300	0.098	11.3	179			_					100		_	-
		1725	0.078	14.8	1239	1187	1122	1084	1043	947	828	711	468		-	-
SE1	-12-426	300	0.076	14-0	215					100	100.4		1055	888	679	556
251	40.400	1725	0.26	14.8	1613	1553	1490	1455	1421	1334	1254	1176	1056	-000	9/3	200
SET	-12-432	300		14.0	281					40.40	1230	1073	639	-	-	_
OE4	-12-436	1725	0.13	16.7	1621	1570	1513	1471	1429	1346	1230	1073	0.10			
SEI	-12-436	300		7 0.1	282		diam'r.	2237	2209	2152	2098	2007	1864		_	
CE1	-14-432	1725	0.27	12.5	2370	2317	2264	2237	2209	2152	2090	2007	1004			
361	-14-402	300	J	1,5	412	2635	2575	2544	2511	2445	2378	2292	2129	1728	1183	
SE1	-14-436	1725	0.38	16.3	2695	2635	521.5	2044	2011	2440	20/0	ELUL	1,155	1011110	-	
SE1-14-440		300	-	-	2386	2307	2234	2205	2176	2119	2048	1973	1877	1435	1282	1163
	-14-440	1725	0.47	2:	415	2301	2244	2200	2770	2.10	2010	-			170	
		300	-	-	2518	2470	2424	2400	2377	2327	2268	2210	2093	1862		
SE1	-16-421	1725	0.36	19	438	6470	6.16.7	2100	19017							
	_	1725	-		3136	3081	3026	2999	2972	2917	2852	2787	2681	2464		
SE1	-16-426	300	0,49	31	545	-	.,									
_		1725		_	3325	3266	3207	3178	3149	3068	3026	2963	2849	2637	2385	180
SE1	-16-428	300	0,61	16,1	578										-	
_		1725		0.4	4019	3956	3894	3863	3832	3768	3697	3629	3526	3262	2790	2214
SE1	1-16-436	300	0.85	21	699								-	0.00	2005	-
		1725		1.2	4164	4690	4017	3980	3943	3859	3768	3676	3519	3157	2826	-
SET	1-18-424	300	0.7	17	724				_				177.00	-	200.41	2000
		1725	0.05	22	4816	4737	4658	4618	4578	4489	4382	4274	4113	3817	3342	2860
SET	1-18-429	300	0.85	22	838				-	2000	0200	2700	2010	3352	-	_
		1550	0.61	24	4148	4074	4000	3963	3926	3859	3793	3726	3610 4143	3953	3718	_
SET	1-20-420	1725	0.84	24	4616	4550	4483	4450	4417	4352	4292	4232	4140	2900	3110	
-		300	4.0		803							_	-	_		-

23

Location Camp Lejeune, NC Sy

System

Exhaust



	Curves & Charts		
Project:	P1383 & P1384 - New Base Entry - Main Admin and Pavilion	_TB#: _	24887
	Bell & Gossett a xylem brand REPRESENTATIVE: James M. Pleasants Co. UNIT TAG: P-1 ENGINEER: SUBMITTAL B-141.1 ORDER NO. DATE: 11/25/2013 DATE: SUBMITTED BY:		
	SPECIFICATIONS FLOW 46 (GPM) HEAD 54 (FT) HP 1.5 RPM 3800 VOLTS 11-2/208-230 VOLTS 0DP Standard Efficient ENCLOSURE 0DP Standard Efficient APPROX. WEIGHT 62		
	HEAD (Feet) 129. 100.		
Location	Camp Lejeune, NC System	P	lumps



Location

NEBB RESEARCH AIR FLO, INC.

			Curv	es & C	harts					
ect:	P1383 8	≩ P1384 -	New Base	e Entry - Ma	ain Admin a	and Pavilio	n		TB#:	-
			P -	2						
	SERIES PL - Permanently Lui dimensions and weights	bricated Boo	oster Pumps					A-135G		
	FLANGE SIZE MICHES -			OIA	ENDIONS - INCHES (mm) D	E	APPROXIMATE SHETTING TIT. LDS. (NG)		
	PL-30 3/4, 1, 1-1/4 & 4-3/2	MOTOR HP	6 5/8 (219)	8 248 (182)	7 128 (191)	4 3/16 (106)	4 3/8 (111)	11.6 (8.3)	İ	
	PL-96 3/4, 1, 1-1/4 6 1-1/2	1/6	8 5/8 (219)	6 3/8 (102)	7 1/6 (181)	4 3/18 (108)	4 3/8 (111)	13.1 (6.0)		
	PL-45 1, 1-1/4 & 1-1/3	1/6	9 1/5 (232)	B 1/2 (216)	7 1/4 (194)	4 5/6 (117)	4 1/2 (114)	14.5 (8.8)	1	
	PL-50 1, 1-1/4 2, 1-1/2	1/6	9 1/8 (232)	8 1/2 (216)	7 1/4 (184)	4 5/8 (117)	4 1/2 (114)	14.5 (6.8)	1	
	PL-55 344, 1, 1-1/4 & 1-1/2 PL-75 2	2/6	9 9/16 (243)	6 3/8 (162) 8 1/2 (216)	7 15/18 (202)	4 3/18 (106) 5 3/16 (132)	4 34 (121)	13.1 (6.0)	}	
	PL130/2" 2 PL130/3" 3 Dimensions are epproximate and subject	2/8 2/8	10 3/4 (273) 10 3/4 (273)	8 1/2 (216) 8 1/2 (216)	8 1/4 (210)	5 3/10 (132) 6 (162)	5 1/6 (130) 5 1/6 (130)	22 (10) 27 (12.2)	1	
	Typical sPECIFICATIONS The contractor shall furnish and in dissirated on the plane and in accords epecifications: 1. The pumps shall be of like horizontal, type, specifically designed and gue operation. 2. The pumps shall have a steel permanently lubilicated, seeled practer pumps are to be adulpped with a value lenkage. Mechanical seal faces to be on the motor shall be non-overloading at performance curve. 3. The motor shall be of the drip-proof bearing, quiet-operating construction, capacitor motor shall be equipped protection. 4. Pumps to be stillable for 225 temperature at 150 psig (10 bar) workin The pumps shall be Sell & Gosesti, A) PL—	ance with the for permanently jub in shaft support ion ball bearing per-tight seed to tribon on sition any point on the figure of the figure o	orleased series be received to series be rec	PL-30 - 30 - 30 - 30 - 30 - 30 - 30 - 30	PL-45	10 15 50 60 61 61 61 61 61 61 61 61 61 61 61 61 61	7 74 85 N C 1 C 4	13 6552 65 14 6000 14 6000 15 10 6000 16 10 6000 17 10 6000 17 10 6000 17 10 6000		
	Xylenk (no. 9200 N. Avadin Avenue 9200 N. Avadin Avenue 9000 N. Avadin Avenue 9000 N. Avadin Programme 9000 N. Avadin Pro	ong of its outsiders					×	ylen Lat's Solve Wate	**	

Camp Lejeune, NC

Pumps

System



Location

RESEARCH AIR FLO, INC.

Curves & Charts TB#: 24887 P1383 & P1384 - New Base Entry - Main Admin and Pavilion System Lubricated Circulators A-127L A In (mm) 4-7/0 (124) 4-7/0 (124) 4-7/0 (124) 4-7/0 (124) In (mm) 4 9/35 (190) 3-11/16 (93) 3-11/16 (93) 4-8/32 (190) 3-11/16 (93) 3-11/16 (93) 3-11/16 (93) 3-11/16 (93) D (mmt) 6-1/92 (192) 5-1/16 (129) 8-1/16 (129) 5-7/32 (112) 5-1/16 (129) in (mm) 3-3/16 (61) 3-3/16 (61) 3-3/16 (61) 3-3/16 (61) in (cum) 2-1/2 (83) 3-1/16 (78) 103269LF 103269LF 103361LF 103361LF 103358LF 103358LF 103255LF 5-1/16 (129) 5-1/16 (129) 3-2/15 (01) 5-1/32 (132) 5-1/10 (129) 4-9/32 (100) 3-11/16 (93) 8-1/18 (129) 8-1/18 (129) 8-3/16 (141) 5-3/10 (141) 8-3/10 (107) 2-1/16 (76) 3-3/16 (82) 3-3/16 (82) 3-3/16 (81) 3-3/10 (81) 3-3/16 (81) 3-3/16 (81) 3-3/15 (61) 63/16 (167) 6-3/9 (162) 103351LP 103401LF 6-3/B (182) NBF-36 103406.F \$-3/4 (146) \$-9/19 (91) of to change. Not to be used for construction purpovaliable in Sizoet 3/4", 1", 1-1/4", and 1-1/2" 3-speed circulators

Camp Lejeune, NC

Pumps

System



Curves & Charts

P1383 & P1384 - New Base Entry - Main Admin and Pavilion Project:

TB#: 24887





PIPE SIZES.

Refer to the ASHRAE recommendations shown in the chart below. Some designers prefer to use 80 percent of the ASHRAE maximum.

ASHRAE Recommended Maximum GPM

ASSISAE CITERLE	Sch. 40 Pigus	Type L Copuer	Numbrat Size
	3.8	2.8	1/2"
3	6.5	5.9	3/4"
Maximum Velocit	11	10	1"
Ider recosec.	18	16	1 1/4"
	25	23	1 1/2
	41	39	2
	72	78	2 1/2
Maximum Loss four feet/10	160	130	3"
feet feet	275	270	4-
	775	775	6"



SELECT THE AUTOFLOW VALVE SPRING RANGE.

Two spring ranges are available for all AutoFlow valves: 2 to 32 psl and 5 to 60 psi. The first number is the differential pressure (AP) needed to achieve design flow. The second is the maximum ΔP where the design flow will be maintained. Following are some general rules on the selection of the spring range, in most cases the amount added to the calculated pump head is 4.6 feet (2 psi X 2,3 feet/psi).

- · For direct return systems, if the total pump head is less than 110 feet, the 2-32 range can generally be used for all units.
- On reverse return systems the 2-32 range can be used for all units.
- For direct return systems with a total pump head exceeding 110 feet, the 5-60 range should be used only on units close to the pump to maintain control.

To calculate the spring range required for a specific terminal unit: Estimate the losses due to

- a) pump accessories such as suction diffusers, check valves, etc.
- b) distribution pipe loss to the terminal unit c) terminal coil, ATC, and Y-strainer drops at

Add a, b, and c and then subtract from the total pump

If less than 74 feet, use the 2-32 range, If greater than 74 and less than 138 feet, use the 5-60 range.

The total pump head is 132 feet and the total of a, b and c is 35 feet, 132 - 35 = 97 Use the 5-60 range since the remaining pump head is greater than 74 feet (32 psl).



Using the chart below, find the available flow according to the size valve required and the system design flow. If the required flow falls between two available flows, round to the nearest flow listed.

Sidn	PSIO	Available Flow Bate (GPM) by Gartridge
1/2-3/4	2 - 32	0.33, 0.5, 0.67, 0.75, 0.88, 1.0, 1.1, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5 3.0, 3.5, 4.0, 4.5, 5.0, 8.0, 7.0, 8.0
	5 - 60	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 5.0, 7.0, 8.0, 9.0, 10, 11, 12
1-1 1/4"	2 - 32	0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 6.0, 7.0, 8.0, 3.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
	5 - 60	1,0, 1.5, 2.0, 2.5, 3,8, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27
1 1/2-2	2 - 32	5.0, 6.0, 7.0, 8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 26, 28, 30, 32, 34, 36, 39, 40, 42, 44, 46, 48, 50
	5 - 60	8.0, 9.0, 10, 11, 12, 13, 14, 15, 16, 17, 18, 16, 20, 21, 22, 23, 24, 25, 36, 27, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 46, 50, 52, \$4, 56, 58, 80, 62, 64, 66, 68, 70
21/2	2 - 32	8.0, 10, 11, 12, 13, 14, 15, 16, 17, 16, 19, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 56, 60, 64, 68, 72, 76, 80
	5 - 60	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 38, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 80, 70, 72, 76, 80, 84, 83, 92, 88, 100, 134, 103, 112, 116, 120

Flows for sizes 3730" are available in increments of 5 GPM for PSID 2-32 and 5-60, and 10 GPM for PSID 3-20, 5-40

Sun	esto:	Max GHM	5640	P\$40	Wax OPM	Stro	PSID	Max GPM
	2-32	135		2 - 32	945		2 - 32	2565
3"	5 - 60	170		5 - 50	1190		5 - 60	3230
	3 - 20	200	8"	3 - 20	1400	14	3 - 20	3800
	5 - 40	250		5 - 40	1750		5 - 40	4750
	7 - 45	300		7 - 45	2100		7 - 45	5700
4"	2 - 32	270		2 - 32	1485		2 - 32	4320
	5 - 60	340	10"	5 - 60	1870	20-	5 - 60	5440
	3 - 20	400		3 - 20	2200		3 - 20	6400
	5 - 40	500		5 - 40	2750		5 - 40	8099
	7 - 45	800		7 - 45	3300		7 - 45	9600
	2 - 32	540		2 - 32	2025		2 - 32	9450
	5 - 60	680		5 - 60	2550	1	5 - 60	11900
6	3 - 20	800	12"	3 - 20	3000	30"	3 - 20	14060
	5 - 40	1000		5 - 40	3750		5 - 40	17500
	7 - 45	1200	11	7 - 45	4500		7 - 45	21000

NOTE: 5", 16", 18" and 24" flows available, see specific submittal

Location

Camp Lejeune, NC

System

Valves

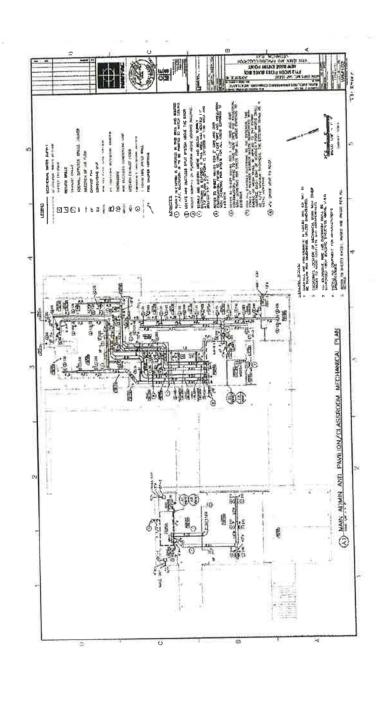


System Diagram
P1383 & P1364 - New Base Entry - Main Admin and Pavilion TB#

Project:

24887
#

Project Address	Diawing Names	
Owner Laurence MC	Floor Plan	Mechanical
camp rejeane, ivo	Drawing By	RCH
	System	Supply & Return



Review Start Date: Response 01 Date: 27 Jun 2016 dd Mmm YYYY Follow-up 01 Date: Review Closed Date: dd Mmm YYYY

P-1383/P-1384 NEW BASE ENTRY POINT & ROAD CONTRACT N40085-12-C-7714 MCB CAMP LEJEUNE, NORTH CAROLINA SUBMITTAL TRANSMITTAL # 1238 NAVFAC ACCEPTANCE – CODE CI52 (PAG)

Title Test and Balance (TAB) Report Submittal Number Two Review

Disposition - Disapproved/Resubmit (D/R)

1. Disapproved / Resubmit (D/R) disposition indicates responses to unclosed issues and a corrected resubmission are necessary at this time.

Action Item Abbreviations

1. Action item abbreviations presented below identify party responsible for resolving issue.

AG = NAVFAC Acceptance Group

CC = Controls Contractor

CM = NAVFAC Construction Manager

CxA = Commissioning Authority

DOR = Designer of Record

EC = Electrical Contractor

TAB = Equipment Supplier

FA = Fire Alarm Contractor

GC = General Contractor

MC = Mechanical Contractor

PM = NAVFAC Project Manager

TAB = Test and Balance Contractor

For Informational Purposes Only = No responsible party, no action required

Introduction

- These issues are based on comparing TAB Report submittal number two dated 09 Jun 2016 with transmittal dated 11 Jun 2016 and received by the acceptance group on 11 Jun 2016 to contract document's and TAB agency certifying organization's requirements. TAB Report submittal number one dated 02 May 2016 was marked preliminary and not formally reviewed.
- 2. Issues are organized into the following sections:
 - General
 - ERV-01
 - Heat Pumps
 - Split Systems
 - Exhaust Fans

- Duct Traverses
- Unit Heaters
- Pumps
- HP Water Heater
- TAB Report Deficiencies
- 3. Approval or acceptance does not relieve contractor of responsibility for any error in accordance with specification 01 33 00 page 15, section 1.13.
- 4. It is the contractor quality control manager's responsibility to ensure responses are obtained from all applicable responsible parties as indicated and are substantive.
- 5. Unless indicated as an issue for action, issues are for informational purposes only.
- 6. The following references serve as the basis of these comments due to the contract award date of 03 Apr 2012:
 - Unified facilities criteria UFC 3-400-10N Mechanical Engineering dated Mar 2012
 - Unified facilities criteria UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings dated Feb 2012
 - American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)
 Fundamentals dated 2009
 - ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality dated 2010

- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings dated 2010
- NEBB's Procedural Standards for Testing Adjusting and Balancing of Environmental Systems dated 2005 serves as the basis of TAB certifying organization's requirements. It should be noted that Procedural Standards page 6, section 2.3.1 states "Regardless of what is specified, in all cases the process by which the data is acquired shall conform to the current edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
- These issues are grouped into system deficiencies that are seldom TAB report deficiencies and TAB report deficiencies that are deviations of the TAB report from contract requirements.
- These issues are based on the premise that all recommendations and suggested practices contained in the TAB agencies certifying organization shall be considered mandatory in accordance with specification 23 05 93 page 3, section 1.3.

General Issues

- Submittal is being reviewed noting systems must be balanced within ±5-percent of design values per specification 23 05 93 page 5, section 3.3.1.
- Submittal includes airflows that are beyond the allowable tolerance of ± 5 -percent of design value as allowed by specification 23 05 93 page 5, section 3.3.1. With some exceptions noted herein, because of system type, operation mode at which tolerance is exceeded, and / or value beyond the allowed tolerance is insignificant, no issues are warranted.

LK.	V-01 Issues
3.	Submittal pages 6 and 7 of 24 include ERV-1 Supply Fan and Exhaust Fan Motor Actual electrical supply voltage of 122 VAC which conflicts with Design supply voltage of 230 VAC It is unclear whether the installed ("Actual" data) motor varies from the submitted ("Design" data) motor or there is another issue. Descriptive information addressing the discrepancy in voltage is necessary to close this issue. – Action Item for MC / TAB 07062016 XXX Response:
	This is not an issue requiring resolution based on basis description.
	This is not all issue requiring resolution based on basis description. This is an issue of concern and has been / shall be resolved by resolution description— Corrected in final report- WM601 calls for 120v unit
4.	Submittal pages 6 and 7 of 24 include ERV-1 Supply and Exhaust Heat Wheel Design Apparent Capacities of 27,637 BTU/Hr and 45,382 BTU/Hr which conflicts with CI52-calculated Heat Wheel Design Apparent Capacities. Descriptive information addressing the discrepancies is necessary to close this issue. – Action Item for TAB
	 ○7062016 XXX Response: ☐ This is not an issue requiring resolution based on basis description. ☐ This is an issue of concern and has been / shall be resolved by resolution description Temperatures were re-taken and recorded in the final report. Unit is basis of Design. These units are not operating under an occupied environment design temps max not be achieved at this time

(E	ubmittal page 7 of 24 includes ERV-1 Exhaust Heat Wheel Actual Entering Air Temperature EAT) wet bulb of 43.7°F (with dry bulb of 67.5°F) yielding 4% relative humidity (RH) which onflicts with an anticipated higher wet bulb. Since the Design EAT RH (50% RH) was
E. to	AT _{wb} . Descriptive information addressing the unit of measure of the 43.7 value is necessary close this issue. – Action Item for TAB 7062016 XXX Response: This is not an issue requiring resolution based on basis description. This is an issue of concern and has been / shall be resolved by resolution description corrections made, temps were re-measured and recorded in final report. These units are not operating under an occupied environment design temps mas not be achieved at this time
	Pumps Issues To comments warranted.
	Systems Issues Io comments warranted.
	ust Fans Issues No comments warranted.
	Traverses Issues No comments warranted.
Unit Heaters Issues 10. No comments warranted.	
11. S e: o 4 is a;	Submittal page 23 of 24 includes HPWH-1 Pump P-2 Actual water flow of 9.0 GPM which exceeds Design water flow of 5.0 GPM by 4.0 GPM or 80-percent, beyond allowable tolerance of 5-percent. Actual Final Head Pressure of 30.5 FT exceeds Design Final Head Pressure of 0.0 FT. Given the configuration of the system and the status of the construction, the pump solation valve downstream of the pump may be utilized as the balance valve and marked appropriately. Descriptive information addressing the water balance results is necessary to close this issue. — Action Item for TAB 17062016 XXX Response: This is not an issue requiring resolution based on basis description. This is an issue of concern and has been / shall be resolved by resolution description P-2 was throttled to design GPM. P-3 is a "Plumbing Pump" and flow will be verified in a separate enclosure. and not part of the HVAC TAB. Pressure readings are recorded infinal report
12. S	Vater Heater Issues Submittal page 24 of 24 includes HPWH-1 Load-side water Actual EAT of 12.1°F which conflicts with the anticipated EAT being above 32°F. Descriptive information addressing the discrepancy is necessary to close this issue. − Action Item for TAB 07062016 XXX Response: ☐ This is not an issue requiring resolution based on basis description. ☐ This is an issue of concern and has been / shall be resolved by resolution description— Typo corrected in the final report.

3 Report Denciencies issues
Submittal excludes certification page and a table of contents which conflicts with specification 23 05 93 page 12, Appendix B. These items are necessary to close this issue.
- Action Item for TAB
07062016 XXX Response:
 ☐ This is not an issue requiring resolution based on basis description. ☐ This is an issue of concern and has been / shall be resolved by resolution description
included in final report.
Submittal excludes TAB supervisor's approval and signature which conflicts with specification
23 05 93 page 13, Appendix B, section 6, b. TAB supervisor's approval and signature are necessary to close this issue. – Action Item for TAB
07062016 XXX Response:
This is not an issue requiring resolution based on basis description.
This is an issue of concern and has been / shall be resolved by resolution description-
included in final report.
Submittal excludes <u>heating systems</u> operational performance documentation during maximum outdoor environmental caused loading which conflicts with specification 23 05 93 page 7, section 3.3.5.2. An estimated date for obtaining this documentation is necessary to close this issue. – Action Item for TAB
07062016 XXX Response:
This is not an issue requiring resolution based on basis description.
This is an issue of concern and has been / shall be resolved by resolution description-
11-15-20162-28-2017 heating season. Submittal excludes calculated capacity documentation within coil performance report sheets
which conflicts with specification 23 05 93 page 6, section 3.3.3.1. This documentation is
necessary to close this issue. – Action Item for TAB
07062016 XXX Response:
This is not an issue requiring resolution based on basis description.
This is an issue of concern and has been / shall be resolved by resolution description-
included in final report.
Submittal excludes updated air system diagrams complete with final installed locations of all terminals and devices, numbering changes, and actual test locations which conflicts with specification 23 05 93 page 14, Appendix B, section 6, d. Diagrams are necessary to close this issue. – Action Item for TAB
07062016 XXX Response:
 This is not an issue requiring resolution based on basis description. This is an issue of concern and has been / shall be resolved by resolution description-included in final report.
Submittal excludes pump performance curves which conflicts with specification 23 05 93 page
14, Appendix B, section 6, h. Curves are necessary to close this issue. – Action Item for TAB 07062016 XXX Response:
This is not an issue requiring resolution based on basis description.
This is an issue of concern and has been / shall be resolved by resolution descriptio-
included in final reportn.
Submittal excludes fan performance curves which conflicts with specification 23 05 93
page 14, Appendix B, section 6, h. Curves are necessary to close this issue. - Action Item for TAB
07062016 XXX Response:
This is not an issue requiring resolution based on basis description.
This is an issue of concern and has been / shall be resolved by resolution description-included in final report.

20.	Submittal excludes factory calibration curves for balancing valves which conflicts with specification 23 05 93 page 15, Appendix B, section 6, i. Curves are necessary to close this issue. – Action Item for TAB
	 07062016 XXX Response: ☐ This is not an issue requiring resolution based on basis description. ☐ This is an issue of concern and has been / shall be resolved by resolution description-included in final report.